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CHUAR'S ILLUSION.

BY MAJOR J. W. POWELL.

IN the fall of 1880 I was encamped on the Kaibab plateau above the canyon gorge of a little stream. White men and Indians composed the party with me. Our task was to make a trail down this side canyon, which was many hundreds of feet in depth, into the depths of the Grand Canyon of the Colorado. While in camp after the day's work was done, both Indians and white men amused themselves by attempting to throw stones across the little canyon. The distance from the brink of the wall on which we were encamped to the brink of the opposite wall seemed not very great, yet no man could throw a stone across the chasm, though Chuar, the Indian chief, could strike the opposite wall very near its brink. The stones thrown by others fell into the depths of the canyon. I discussed these feats with Chuar, leading him to an explanation of gravity. Now Chuar believed that he could throw a stone much farther along the level of the plateau than over the canyon. His first illusion was thus one very common among mountain travellers —an underestimate of the distance of towering and massive rocks when the eye has no intervening objects to divide the space into parts as measures of the whole.

I did not venture to correct Chuar's judgment, but simply sought to discover his method of reasoning. As our conversation proceeded he explained to me that the stone could not go far over the canyon, for it was so deep that it would make the stone fall before reaching the opposite bank; and he explained to me with great care that the hollow or empty space pulled the stone down. He discoursed on this point at length, and illustrated it in many ways. "If you stand on the edge of the cliff you are likely to fall; the hollow pulls you down, so that you are compelled to brace yourself

against the force and lean back. Any one can make such an experiment and see that the void pulls him down. If you climb a tree the higher you reach the harder the pull; if you are at the very top of a tall pine you must cling with your might lest the void below pull you off."

Thus my dusky philosopher interpreted a subjective fear of falling as an objective force; but more, he reified void and imputed to it the force of pull. I afterward found these ideas common among other wise men of the dusky race, and once held a similar conversation with an Indian of the Wintun on Mount Shasta, the sheen of whose snow-clad summit seems almost to merge into the firmament. On these dizzy heights my Wintun friend expounded the same philosophy of gravity.

Now in the language of Chuar's people, a wise man is said to be a traveller, for such is the metaphor by which they express great wisdom, as they suppose that a man must learn by journeying much. So in the moonlight of the last evening's sojourn in the camp on the brink of the canyon, I told Chuar that he was a great traveller, and that I knew of two other great travellers, among the seers of the East, one by the name of Hegel and another by the name of Spencer, and that I should ever remember these three wise men, who spoke like words of wisdom, for it passed through my mind that all three of these philosophers had reified void and founded a philosophy thereon.

Concepts of number, space, motion, time, and judgment, are developed by all minds, from that of the lowest animal to that of the highest human genius. Through the evolution of animal life, these concepts have been growing as they have been inherited down the stream of time in the flood of generations. It is thus that an experience has been developed, combined with the experience of all the generations of life for all the time of life, which makes it impossible to expunge from the human mind these five concepts. They can never be cancelled while sanity remains. Things having something more than number, space, motion, time, and judgment, cannot even be invented; it is not possible for the human mind to conceive anything else, but semblances of such ideas may be produced by the mummification of language.

Ideas are expressed in words which are symbols, and the word may be divested of all meaning in terms of number, space, motion, time, and judgment, and still remain, and it may be claimed that it still means something unknown and unknowable; this is the origin of reification. There are many things unknown at one stage

of experience which are known at another, so man comes to believe in the unknown by constant daily experience; but has by further converse with the universe known things previously unknown, and they invariably become known in terms of number, space, motion, time, and judgment, and are found to be only combinations of these things. It is thus that something unknown may be conceived, but something unknowable cannot be conceived.

No man conceives reified substrate, reified essence, reified space, reified force, reified time, reified spirit. Words are blank checks on the bank of thought, to be filled with meaning by the past and future earnings of the intellect. But these words are coin signs of the unknowable and no one can acquire the currency for which they call.

Things little known are named and man speculates about these little-known things, and erroneously imputes properties or attributes to them until he comes to think of them as possessing such unknown and mistaken attributes. At last he discovers the facts; then all that he discovers is expressed in the terms of number, space, motion, time, and judgment. Still the word for the little-known thing may remain to express something unknown and mystical, and by simple and easily understood processes he reifies what is not, and reasons in terms which have no meaning as used by him. Terms thus used without meaning are terms of reification.

Such terms and such methods of reasoning become very dear to those immersed in thaumaturgy and who love the wonderful and cling to the mysterious, and, in the revelry developed by the hashish of mystery, the pure water of truth is insipid. The dream of intellectual intoxication seems more real and more worthy of the human mind than the simple truths discovered by science. There is a fascination in mystery and there has ever been a school of intellects delighting to revel therein, and yet, in the grand aggregate, there is a spirit of sanity extant among mankind which loves the true and simple.

Often the eloquence of the dreamer has even subverted the sanity of science, and clear-headed, simple-minded scientific men have been willing to affirm that science deals with trivialities, and that only metaphysics deals with the profound and significant things of the universe. In a late great text-book on physics, which is a science of simple certitudes, it is affirmed:

"To us the question, *What is matter?*—What is, assuming it to have a real existence outside ourselves, the essential basis of the phenomena with which we may as physicists make ourselves ac-

quainted?—appears absolutely insoluble. Even if we become perfectly and certainly acquainted with the intimate structure of what we call Matter, we would but have made a further step in the study of its properties; and as physicists we are forced to say that while somewhat has been learned as to the properties of Matter, its essential nature is quite unknown to us."

As though its properties did not constitute its essential nature.

So, under the spell of metaphysics, the physicist turns from his spectroscope to explain that all his researches may be dealing with phantasms.

Science deals with realities. These are bodies with their properties. All the facts embraced in this vast field of research are expressed in terms of number, space, motion, time, and judgment; no other terms are needed and no other terms are coined, but by a process well known in philology as a disease of language, sometimes these terms lapse into meanings which connote fallacies. The human intellect is of such a nature that it has notions or ideas which may be certitudes or fallacies. All the processes of reasoning, including sensation and perception, proceed by inference; the inference may be correct or erroneous, and certitudes are reached by verifying opinions. This is the sole and only process of gaining certitudes. The certitudes are truths which properly represent noumena, the illusions are errors which misrepresent noumena. All knowledge is the knowledge of noumena, and all illusion is erroneous opinion about noumena. The human mind knows nothing but realities and deals with nothing but realities, but in this dealing with the realities—the noumena of the universe—it reaches some conclusions that are correct and others that are incorrect. The correct conclusions are certitudes about realities; the incorrect conclusions are fallacies about realities. Science is the name which mankind has agreed to call this knowledge of realities, and error is the name which mankind has agreed to give to all fallacies. Thus it is that certitudes are directly founded upon realities; and fallacies alike all refer to realities. In this sense then it may be stated that all error as well as knowledge testifies to reality, and that all our knowledge is certitude based upon reality, and that fallacies would not be possible were there not realities about which inferences are made.

Known realities are those about which mankind has knowledge; unknown things are those things about which man has not yet attained knowledge. Scientific research is the endeavor to in-

crease knowledge, and its methods are experience, observation, and verification. Fallacies are erroneous inferences in relation to known things. All certitudes are described in terms of number, space, motion, time, and judgment; nothing else has yet been discovered and nothing else can be discovered with the faculties with which man is possessed.

In the material world we have no knowledge of something which is not a unity of itself or a unity of a plurality; of something which is not an extension of figure or an extension of figure and structure; of something which has not motion or a combination of motions as force; of something which has not duration as persistence or duration with persistence and change.

In the mental world we have no knowledge of something which is not a judgment of consciousness and inference; of a judgment which is not a judgment of a body with number, space, motion, and time. Every notion of something in the material world devoid of one or more of the constituents of matter is an illusion; every notion of something in the spiritual world devoid of the factors of matter and judgment is a fallacy.

In the intoxication of illusion facts seem cold and colorless, and the wrapt dreamer imagines that he dwells in a realm above science—in a world which as he thinks absorbs truth as the ocean the shower, and transforms it into a flood of philosophy. Feverish dreams are supposed to be glimpses of the unknown and unknowable, and the highest and dearest aspiration is to be absorbed in this sea of speculation. Nothing is worthy of contemplation but the mysterious. Yet the simple and the true remain. The history of science is the history of the discovery of the simple and the true; in its progress fallacies are dispelled and certitudes remain.

BLAISE PASCAL.

(1623–1662.)

BY PROF. L. LÉVY-BRUHL.

TWO periods are to be distinguished in Pascal's life: the first, in which he busied himself with mathematical and physical sciences, and the second, in which, being thoroughly convinced of the vanity of these sciences, he confined himself to the science of morals.

As a natural philosopher Pascal was one of the most pronounced in his advocacy of the rights of experience and reason as against the method of authority. The fragment of the *Traité du Vide* expresses, in a wonderfully eloquent style, ideas which Bacon, Descartes and many others had previously advocated. Pascal's way of demonstrating them is decisive; by his very analysis of the notions of science and of antiquity he determines in what case and in what measure respect is due to the opinions of the ancients.

Here Pascal even brings to light a point already touched upon by Bacon, but ignored by Descartes. In laying down the first rule of his method "to hold nothing as true unless one has evidence of its being so," Descartes based his reasons entirely upon the abstract idea of science and upon the model of mathematics. For him these were sufficient motives to regard everything that preceded him as null and void, and absolutely to *ignore* tradition. He proposed to build up a philosophical system as if none had ever existed before him. Pascal, on the contrary, analyses the confused idea of tradition, and seeks to derive thence the idea of progress. He represents mankind in its entirety as a single man living forever and learning continually. Had not Descartes been so wholly taken up with his desire of utterly abolishing scholastic philosophy, he might also have noticed, were it but in geometry and astronomy, the onward march of scientific knowledge, which

is the most luminous illustration of "progress" that can be given. Pascal's idea is a remarkable one, inasmuch as it emphasises the continuity of progress. We shall find it reviving in the eighteenth century, under various forms, until the natural sciences, and particularly biology, substituted for the notion of uninterrupted progress the more complex conceptions of evolution and adaptation.

In Pascal's views of scientific method, the influence of Descartes is almost everywhere perceptible. Like Descartes, he has but little esteem for formal logic; real logic is to be found in mathematics. A method of avoiding error is sought by every one. Logicians profess to know the way to it, but geometricians alone reach it, and outside their science and whatever imitates it, real demonstrations do not exist. Geometry therefore is the only real science, and this privilege it owes to the "order" which it follows. (Descartes himself had said, "The method consists wholly in the order to be observed," etc. Lastly, even as mathematics furnished Descartes with the idea of his philosophical method, so geometry suggested to Pascal that of a "still loftier and flawless" one. But, unlike Descartes, who thought he had found the demonstration of the true philosophy, Pascal believes that a perfect method is beyond the reach of man. Geometry has to take for granted the definitions from which it proceeds and the axioms on which it rests, whereas a perfect procedure would define and demonstrate everything. Geometricians, however, are quite justified in not demonstrating that two quantities which are equal to a third are equal to each other, and in not giving a definition of space, time, and number, for such explanations as they might give of these notions would create obscurity rather than enlightenment. It is sufficient if their definitions and axioms be so perfectly clear and evident as absolutely to preclude denial. But still it is an imperfection in their science that these things have to be taken for granted.

Thus geometry, although the least imperfect of human sciences, can demonstrate nothing except by admitting undemonstrable principles, and define nothing except by using undefinable terms. The question, whence these principles and notions are derived, is a serious subject of discussion among philosophers. Some ascribe their origin to experience, others to the independent activity of the mind. According to Pascal, these principles spring from the "heart;" that is, we believe in them instinctively, and such a belief is as firm as any which reasoning can engender in us. "The heart" tells us that there are three dimensions in space, and that the succession of numbers is infinite. Principles we feel, proposi-

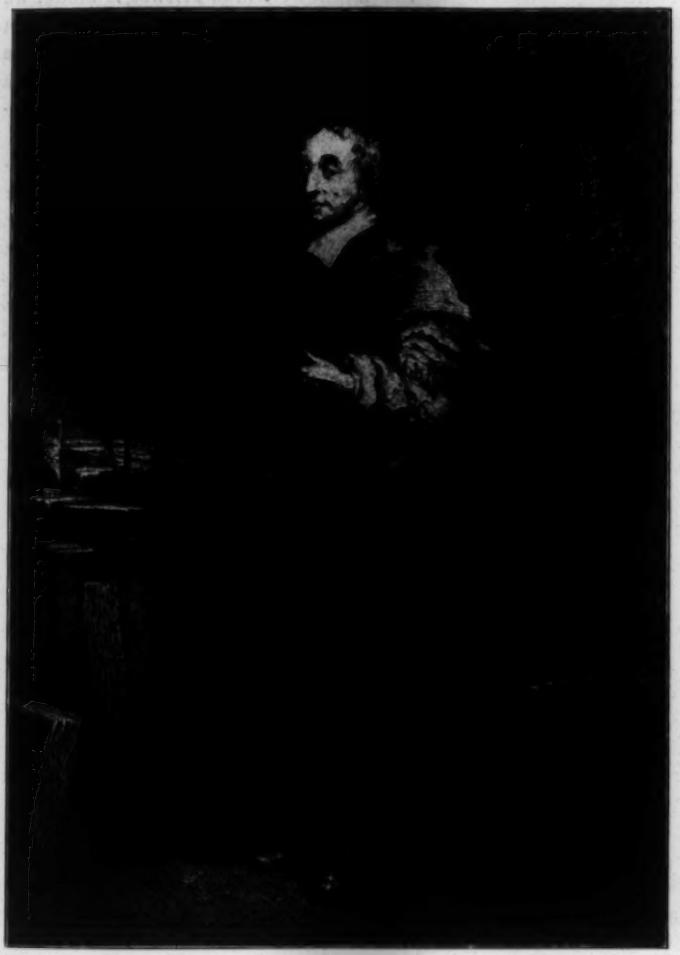
tions we infer, and both with certainty, although by different means. And there would be as much absurdity in reason's asking the heart for proofs of its first principles before adhering to them as in the heart's asking reason to feel all the propositions it demonstrates before accepting them.

This is therefore no check upon geometry. It merely supposes us to know what is meant by the words *motion*, *number*, *space*. Without stopping for useless definitions, it penetrates into the very nature, and discovers the wonderful properties, of these three things, "which," says Pascal, speaking as a true Cartesian, "comprise the whole universe." But if we try to push our reflexion higher, and to apply it to these principles themselves, we are stopped at the very first step and obliged to confess our ignorance. "Our soul is cast into our body, where it finds number, time, dimension; it calls these nature or necessity, and can believe nothing else." Seldom was Pascal more profound than in these few words. He touches here upon the idea of the relativity of knowledge. He intimates that the necessity of natural laws may possibly be only the necessity of the laws of our own thought, and that these fundamental laws, both of thought and of nature, may also, in some way unknown to us, proceed from the human organisation. Therefore, "what goes beyond geometry is beyond our reach."

The critique of the faculties of the human understanding, which was not in Pascal's plan, is partly replaced in his *Pensées* by the consideration of the Infinite, the idea of which plays an important part in his philosophy. According to him we know that the Infinite exists, but we are ignorant of its nature. We are acquainted with the existence of infinite number and of infinite space, but cannot form conceptions of them. We know, at least, that the finite is incommensurable with the infinite. Therefore man, being finite, is unproportioned to the idea of the infinite; is lost and swallowed up in it. In this infinite sphere, the centre of which is everywhere and the circumference nowhere—where do we stand? The question is of course unanswerable. "For what is man in nature? Nothing as compared with the infinite, everything as compared with nothingness—a mean between nullity and all. Utterly powerless to embrace the extremes, therefore the end and the principle of things are forever wrapped in impenetrable mystery for him. He is incapable, in fine, of perceiving either the nothingness out of which he is drawn, or the infinite in which he is ingulfed."

From this it follows that nature is as incomprehensible as God Himself, who created it. It is therefore useless to reduce the sci-

ence of nature to that of geometry, as Descartes does (Pascal does not question here the rightfulness of the procedure); it is useless

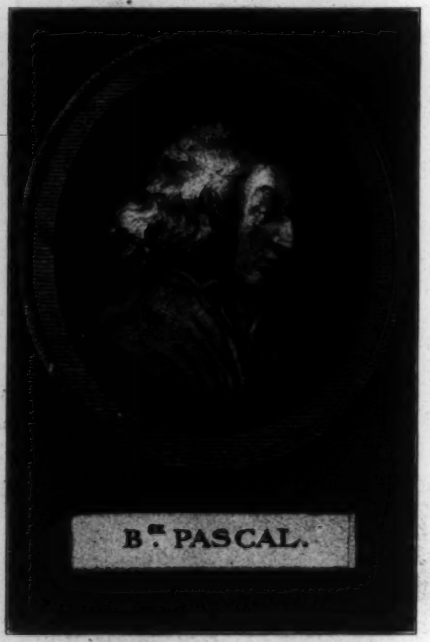


BLAISE PASCAL.

to establish a geometrical "order," as the most perfect that man can attain to. It must still be admitted that between infinite space and the space which we conceive there is a boundless chasm, and

that our most intelligible science is based on principles which we do not understand. And if, instead of reflecting upon the object of science, we reflect upon the mind by which science is made, we are brought to the same confession; for we then percieve that our understanding, in the order of intelligible beings, holds the same place as our body in the order of extended objects.

The parallelism (a genuinely Cartesian one) involves conclu-



From an Engraving by St. Aubin of the bust of Pajou.

sions which Pascal draws at once. Even as our body is but an imperceptible speck in comparison with infinite space, so our understanding, in spite of all its exertions, is infinitely remote from the perfect comprehension of things. Whether contemplating them from above or from below, it is still equally far from the end. We are sequestered in a hidden province of the universe, from which it were sheer madness to think of escaping. We are likewise confined to a certain degree of intelligence, higher than which

our faculties forbid us to rise. In the range of thought, as well as of space, we are a mean between nothing and everything, infinitely remote both from lifeless, unthinking matter and from that Absolute Thought which sees Being while creating it. Our knowledge is bound to certain conditions. Man's pretension to absolute knowledge can spring only from an absurd—one might almost say, infinite—presumptuousness.

BLAISE PASCAL.

From an Engraving by Honriot.

If, therefore, Pascal, in speaking of science, is now sympathetic and admiring, now scornful and derisive, the diversity of his language is easily explained, and we need not suppose that Pascal, after admitting the validity of human reason in the earlier part of his life, despaired of it in the latter, and abandoned himself to scepticism. It is sufficient to observe that Pascal in some passages views science from the standpoint of the finite and in others from

that of the infinite. In the first passages, when contemplating science from a purely human point of view, he finds it to be logically unassailable (at least as regards geometry) and he extends this praise to "what imitates it," probably alluding to philosophies of the stripe of Descartes's, which vies with mathematics in rigor. But when contemplating science and philosophy from the point of view of the infinite, their vanity, powerlessness and uselessness appear obvious to him, for there is no proportion between the human mind, which is finite, and the infinite object with which science is concerned. Thus Pascal may say, without recourse to moral or religious argument: "Philosophy (that is the science of nature) is not worth an hour's pains. . . . . To write against those who pursue the sciences . . . . to scoff at philosophy—that is to be the true philosopher."

For the same reasons, and without being self-contradictory, Pascal shows himself alternately favorable and hostile to Cartesianism; yet this is no reason for inferring that he has changed his opinion. If there must be a science of physics, he evidently prefers that of Descartes to that of Aristotle. What he thinks ridiculous is the vain hope of attaining to a complete and definitive explanation of nature. Therefore, in speaking as a geometrician or natural philosopher of the Cartesian doctrine, he does not hesitate to praise it; he even admires the *cogito* and the consequences inferred from it by Descartes. But when comparing such a philosophy to the infiniteness of nature, which is the object of it, he finds it no less presumptuous and bold than the others. The closer he considers the infinite, the less interested he becomes in geometry and natural sciences; not that they seem to him less true than they did before, but that he sees the emptiness of them more clearly. Another science attracts him—the science of man, in which all his dearest concerns are at stake.

* * *

The science of man, or of morals, as we know, was not to be found among philosophers. Pascal, however, was far from rejecting as worthless all that they had said on the subject. Two sects appeared to him particularly worthy of esteem, for each of them had partly descried the truth: the Stoics, represented by Epictetus, and the Epicureans, represented by Montaigne.

Epictetus knew the duties of man admirably well. He repeatedly stated that man's only study and desire should be to recognise and obey the will of God. He wished man to be persuaded that God governs all things with justice, to submit to Him willingly, and al-

ways to have before his eyes the thought of death and of the most unbearable sufferings; thus triumphing over mean thoughts and immoderate desires. But after speaking of the duties of man in such language as would befit a Christian, Epictetus fails to acknowledge man's powerlessness. He is carried away by his pride. He falls into perdition by presuming too much on man's strength. He does not perceive that the nature of man is incapable of fulfilling its duty toward God alone and unaided. He magnifies man's liberty, whereas man is really a slave to sin; he extols man's power, which he likens to that of the gods, whereas ever since the original fall man has been corrupt and miserable. And so this admirable system of ethics leads to "diabolical pride."

Montaigne falls into the opposite error. This philosopher has an incomparable faculty of making men realise their own weakness. He insensibly overthrows all that is looked upon by men as absolutely certain, not in order to establish the contrary with the very certitude which he rejects, but merely to show that since appearances point with equal force to both conclusions, we cannot possibly know whereon to ground our belief. He shows the pliableness of reason for all purposes and the vanity of its principles, even of those which are regarded as firmest and most natural, the errors into which man is inevitably allured by his imagination, the tyranny exercised upon him by custom and example, and his ridiculous self-assumption. Thus reason, being "irretrievably foiled by its own weapons," is reduced to silence, and so abased that it can no longer decide whether it is superior or equal to the instinct of animals.

But on the other hand, Montaigne acts like a heathen. While pointing out admirably man's natural helplessness, which Epictetus ignored, Montaigne, with a cravenness doubly shameful in a Christian, neglects the duties of man, which Epictetus knew so well. He follows custom and instinct, and thus even as the Stoic is led astray by his pride, the Epicurean is led astray by his sloth.

Would, now, the solution consist in accepting both Epictetus's and Montaigne's mode of reasoning, merely placing them in juxtaposition? Shall we obtain the true science of morals by conceiving the duties of man as Epictetus did, and his helplessness as Montaigne did? No; such a solution is unacceptable. Montaigne does not complete Epictetus; he directly contradicts him. Placing them together would result in nothing except strife and mutual destruction; for as the one has established certitude and the other

doubt, and the one has championed the grandeur of man and the other his weakness, both their errors and their truths are mutually nullified. To reach an acceptable solution, we must discover a higher point of view, from which the contradictory elements will be reconcilable.

In spite of the diversity of the problems in question the method here followed by Pascal offers a striking analogy with that employed afterward by Kant in overcoming the antinomies of pure reason. In the third antinomy especially, Kant shows that reason cannot decide between two conflicting propositions. It cannot give up the idea that there are free causes in the universe, as for instance, man's will; but it also does not think it possible to give up the idea of the necessary concatenation of causes and effects. The interest of morals forbids that liberty should be sacrificed; the interest of science demands determinism. How does Kant overcome the antinomy? By showing that the two statements are not absolutely contradictory, but are only so in a certain sense, and that, *from different points of view*, they are both true. *In time* it is true that every phenomenon must needs be the result of antecedent phenomena. But *out of time* the law of causality is no longer necessary, and nothing justifies us in asserting of "things-in-themselves" what we know to be true as regards phenomena. So that determinism remains true in the world of experience, while liberty also prevails in that of absolute reality. The antinomy is overcome.

In the same way the moral science of philosophers, according to Pascal, results in a seemingly insoluble antinomy. Man cannot at the same time be incurably helpless, as Montaigne says, and have duties imposed upon him such as are pointed out by Epictetus; yet both of them were right. What, then, shall raise us to the higher point of view from which this contradiction disappears? Reason by itself is unable to do so. Its most strenuous exertions may carry it as far as Epictetus or Montaigne, but not beyond them. This the Gospel alone can do. It reconciles these contrarieties by a purely divine art; and by uniting all that is true, and by rejecting all that is false, makes of the result a truly celestial body of wisdom, wherein the conflicts which by human doctrine were irreconcilable are found to agree. And the reason of this success is that the philosophers of the world have always *put contrary things together in one and the same subject*, the one attributing man's grandeur to nature, and the other his weakness to the same source—a formal contradiction; whereas faith has always

taught us to place them *in different subjects*, attributing to nature what is infirm and what is powerful to the grace of God. Man in the helpless state conceived by Montaigne is man fallen and corrupted by sin. Man able to fulfil the duties conceived by Epictetus is another man, regenerated and redeemed by Christ, supported by God's grace. Here also the antinomy is overcome.

There remains, however, an essential difference between the case of Kant and that of Pascal. Never for a moment does Kant abandon the ground of philosophy, and the elements of his solution are supplied to him by his own *Critique of Pure Reason*. But according to Pascal the antinomy of the science of morals would have remained forever insoluble had not God condescended to enlighten us. Pascal abandons the domain of reason and appeals to faith. In order to justify such a momentous step he had to show its undeniable necessity; in other words, he had to demonstrate that the antinomy could not possibly be solved in any other manner. The science of man must appear as evident and easy to grasp from Pascal's Christian point of view, as it is absurd and unintelligible from any other point of view.

In this sense, Pascal's *Entretien avec M. de Saci sur Epictète et Montaigne* may be looked upon as a sketch, afterward to become a completed picture in the *Pensées*. We see him, in this latter work, expatiating on the grandeur and misery of man with such a passion that the strokes never seem to him strong enough or the contrast sufficiently conveyed to the reader. "What a chimera man is, what a strange monster, what a chaos, what a subject for contradiction, what a prodigy! Judge of all things, and a miserable worm; a depository of truth, and a sink of uncertainty and error; at once the glory and the scum of the universe! . . . . If he extols himself, I humble him; if he abases himself, I exalt him, and always I contradict him, until he comprehends that he is an incomprehensible monster." Then, but only then, could Pascal propose, or rather impose, the only solution which, according to him, was to throw a light into this darkness: "Hearken unto God."

Pascal's method was that of persuasive demonstration, which he adopted after mature meditation, and from which he never swerved. The criticism of the dogmatic and Pyrrhonian doctrines, the picture of man's incomprehensible condition, of his grandeur and misery, the examination of social ethics, the exposition of the proofs of Christianity, all tended to one object—namely, to showing that reason itself leads to belief and finally submits to revela-

tion. But the *Pensées* have been handed down to us in a fragmentary and unfinished form; and though one can restore the leading ideas and even the main lines of the plan followed and desired by the author, one is also at liberty to regard the book as a simple collection of reflexions and maxims without reference to their hidden links and connexions, and so to emphasise only certain parts of them to the relative neglect of the others. This has been done, for instance, by those who being chiefly impressed by what Pascal says of the weakness of human reason have mistaken him for a sceptic. Thus, also, the *Pensées* have often been read for their own sake, without much regard for the end which Pascal wished them to serve. And thus it has happened also that their influence, which has been great, has not fulfilled the intentions of their author, and through such not infrequent irony of fate this great apologist of the Christian religion has supplied its enemies with a whole arsenal of weapons.

His very theory of reason, which was impotent beyond certain limits, was in itself somewhat dangerous to the cause he wished to uphold. It was quite a different thing from Montaigne's scepticism. The latter was a means employed by Montaigne to combat fanaticism and the evils engendered by it; but it was only a means, and did not prevent Montaigne from preserving a certain number of moral convictions to which he was wedded; the arguments on which that scepticism was grounded had nothing original about them. Pascal's more penetrating genius raised the question of the legitimate use of human reason itself, and sought to assign its limits. On the one hand, he acknowledges the value of positive science (provided it admits the derived nature of its principles) and in this he is unlike the traditional and improbable sceptic invented by philosophers. But, on the other hand, he affirms that "what goes beyond geometry is beyond our reach," and we also know that science derives its principles from a superior domain, access into which is denied us. We are aware of the existence of the infinite, but ignorant of its nature, of which we must remain forever ignorant, since there is no proportion between us and the infinite. Pascal here opened the door to agnosticism, of which our century has beheld numerous and various forms. Now agnosticism may be and often is found associated with religious tendencies; but it may also be antagonistic to religion. At any rate, it is nowise connected especially with the Christian belief or the Roman Catholic dogma. History shows that the abandonment of rational metaphysics has not been beneficial to revealed religion.

Thus, as regards the relations between reason and faith, with which Pascal was so infatuated, the result of his exertions ran diametrically counter to his purpose. When he says that Christian dogma, in the eyes of the world, is a vain folly, that the original sin condemning thousands of guiltless beings to eternal damnation is revolting to our sense of justice, the philosophers of the eighteenth century are loud in their praise. Many also approve of Pascal's regarding the philosophical proofs of the existence of God as inadequate to convince hardened atheists. They easily grant that reason is one thing, that faith is another thing, and that there is no natural transition between the two. But when he thence infers that one must be a Christian, he is no longer followed. His premises are retained and his conclusions dropped, to the great benefit of unbelief and of natural religion, both of which he almost equally detested.

It was next in the order of Pascal's method of demonstration to prove, as Montaigne had done, that man's reason is powerless to regulate his conduct, and that custom and prejudice alone support morals. He proceeded to this proof with such earnestness and energy that even his friends were terrified, and did not dare to publish this part of the *Pensées* without extenuating, in almost every sentence, the boldness of his thought and the harshness of his words. Yet there remained in it reflexions on justice, on law, on property, on social distinctions and privileges, and even on sovereignty, the daring of which was not surpassed in the eighteenth century. Pascal concluded that all these social institutions are mere conventions, unjustifiable to reason. Not being able to make strong what was just, men have made just what was strong. These conventions, though not respectable in themselves, become so in the eyes of a Christian; so that the frame of the social order indirectly serves to prove the truth of Christianity, since on this truth the validity of the social frame depends. But the philosophers of the eighteenth century neither were nor wished to be Christians; they merely gathered from Pascal's arguments that social institutions were a heap of rubbish, nonsense, and injustice.

Lastly, Pascal, admitting no other direct proofs of supernatural religion than supernatural facts, grounds his faith on prophecies and miracles. "Were it not for miracles," he says, "I should not be a Christian." A momentous saying, because it was liable to be interpreted quite otherwise than Pascal intended. Pascal does not mean that if miracles appear incredible to a man he is thereby exempted from being a Christian. Pascal means, on the contrary

that whoever has faith finds in miracles wherewith to explain his faith, to himself at least. He understands that prophecies and miracles prove the truth of Christianity, and if the demonstration has no effect on certain minds, it is because God has willed them to remain blind. It is not the demonstration which is insufficient; it is they who are not in a fit state to receive it.

Still Pascal was here again opening a dangerous path. Hitherto the discussion of the outward proofs of Christianity had seldom extended itself beyond the world of theologians. Pascal was among the first to transfer it to the public domain of philosophers and men of letters. He was as poorly armed for such a discussion as can be imagined, though it is true that very few men in his time were better equipped. The divine nature of the sacred texts had prevented even the thought of a critical examination of them. But the adversaries of Christianity, although rather inexperienced in this style of criticism, soon felt that they might turn to good account the example set by Pascal. The part played in their controversy by the discussion of prophecies and miracles is sufficiently well known. Voltaire was inexhaustible on the subject of sacred history. And we may wonder whether the scientific exegesis which came later, disinterested and impartial as it was, did not deal an even heavier blow than these gibes and taunts to the beliefs which Pascal would fain have strengthened!

THE SCIENTIFIC ACHIEVEMENTS OF BLAISE PASCAL.

BY T. J. McCORMACK.

M. LÉVY-BRUHL, whose article in the present *Open Court* on the philosophy of Pascal will have won the attention of our readers for one of the most remarkable geniuses of modern times, well remarks that by a strange irony of fate the very weapons which Pascal forged for the corroboration of his faith were by his successors turned into one of the deadliest instruments for its destruction. Science pursues its irresistible march through and in spite of the personalities in which it is incarnate, and amid all their aberrations, works out unfailingly its own salvation. Where it is impeded it sweeps to ruin, with puissant hand, the obstacles that are set in its path, and by virtue of that immanent and mighty power in the world which makes for truth, accomplishes eternally its own aims. "There are two souls," sayeth the poet, "inhabitant in every breast"; the one destined to immortality, the other to decay; the one clad in the eternal raiment of truth, the other in the muddy vestures of clay. And so it was with Blaise Pascal. Even that which was perishable in him had more, perhaps, of immortality in it than have the perishable parts of most men; but as compared with the standard of creation which he himself had set, it was foreordained to annihilation; and the World-Spirit, mocking and girding, as it were, at his worser half, and thinking forsooth that it was merry sport—

"To have the engineer
Hoist with his own petard,"

made his better part the saviour of the whole, and has handed him down to us, as an admirer has characterised him, "one of the sublimest spirits of the world."

Apart from Pascal's merits as a shaper of French literary style, and as an ethical essayist of the first order, it is his achievements in mathematics and physics, and not his pietistic and theological maunderings, however much they have been lauded, that constitute his real contribution to civilisation. We shall supplement, therefore, the fine exposition which Professor Lévy-Bruhl has given of his philosophy, by a popular reference to his work in science; but shall first give from another pen a brief sketch of his life.

"Blaise Pascal was born at Clermont in Auvergne, France June 9, 1623. He was the only son of Etienne Pascal, President of the Court of Aids in that province, himself a learned and respectable man and able mathematician, who, when his boy had reached his eighth year, resigned his office and removed to Paris, for the purpose of watching over his education. From his childhood, Blaise displayed abilities far above the common order, and evinced so inquiring a spirit that, as his sister has recorded, he would not rest without knowing the reason of everything. The bent of his infantile genius was decidedly mathematical; but his father who was his only preceptor, and who was anxious that his attention should not be distracted from the study of the dead languages, resolved to exclude every notion of geometry from his mind, removed all books which treated of that science, and even abstained in the child's presence from any conversation on mathematical subjects with his friends. Notwithstanding these precautions, however, young Blaise, when only in his twelfth year, without the aid of books or oral instruction, began to draw figures with charcoal on the floor of his room, and had, without any assistance, made some progress in geometry before his father surprised him in these researches.

"After this discovery, he was thwarted no more in the pursuit of mathematical investigations; and at sixteen years of age he produced a treatise on the conic sections, of such excellence as to provoke the incredulity and wonder of Descartes, who would not believe that so extraordinary a performance was the work of a mere youth. In his nineteenth year he invented an ingenious machine for making arithmetical calculations, which excited the admiration of his times; and, afterwards, at the age of twenty-four years, the conjecture of Torricelli that the atmosphere had weight, and that this quality might account for effects before ascribed to the horror of a vacuum, led him to institute many able and successful experiments on this subject, which confirmed the truth of Torricelli's idea, and established his own scientific reputation. The results of these labors were collected into two essays, which appeared after his death, *On the Equilibrium of Liquids*, and *On the Weight of the Atmosphere*.

"From these researches, made before he had completed his twenty-fifth year, the great mind of Pascal was diverted entirely to objects of religious contemplation; and thenceforward he abandoned almost entirely the pursuits of science. He practised the most rigid abstinence from all worldly enjoyments, and wore next to his skin a cincture of iron studded with points, which he struck with his elbow into his flesh, as a punishment to himself whenever any sinful thought obtruded itself into his mind.

"It is a curious exemplification of the anomalous conditions of the human mind, that, while Pascal was immersed in these superstitious observances, he published his famous *Provincial Letters*, in which, under the name of Louis de Mon-

talto, he assailed the morality of the Jesuits with equal wit and argumentative acumen. He was induced to write this work by his adoption of the opinions of the Jansenists, which he warmly espoused, and which involved him in the religious disputes of his age and country. Among the fruits of his devotional exercises may also be named his *Pensées*, which were collected and published after his death; and in which he has beautifully availed himself of an idea of one of the ancient fathers, that he who believes in the existence of a God gains eternally if he be right, and loses nothing if wrong; while the atheist gains nothing if right, and renders himself miserable eternally if he be wrong. The weakly frame of Pascal was reduced to premature old age by infirmities, which were aggravated by his ascetic habits, but which he bore with exemplary patience; and he died in Paris, August 19, 1662, aged thirty-nine years. His life was written elaborately by his sister, Madame Perier." (*Quoted from the English Cyclopædia.*)

PASCAL'S ARITHMETICAL MACHINE.

Natural arithmetical machines have been in use among savage and civilised nations from the earliest time. Their employment, however, from our present advanced point of view, denotes rather an inferior than a superior stage of intellectual development. The fingers, strings of beads, knots in cords, notches in sticks, etc., etc., were the means primitively employed in computation; counting was a motor act, an act of sense, and not one of the intellect; the results were the actual things added or subtracted, and not symbols representing those results. The original intellectual advance, therefore, consisted rather in the abolition of this primitive machinery and in the substitution for it of a procedure which was mainly psychical and mnemonic, involving a mechanical knowledge of the simple combinations of numbers, of the multiplication table, and of the use of pencil and paper. But with the transference of computation to the psychical domain, came the new danger of the multiplication of errors; the more delicate and sensitive a mechanism is, the more apt it is to become deranged.

The abacus of the Romans and the swanpan of the Chinese were advanced types of the natural counting machine; but their manner of recording results, though an improvement on the old, and slightly symbolical, was almost identical with the operation to be performed, and involved little saving of labor. M. Huc, in his *Travels in Tartary, Thibet, and China*, has aptly illustrated this point by his recital of the astonishment of the Chinese money-changers at the rapidity and accuracy with which he and his companion performed their calculations,—a rapidity and accuracy that were far in advance of anything that the users of the swanpan could offer. The abacus, which in its various forms continued to be used in the South of Europe until the end of the sixteenth century, and in

England until even a later period, met, therefore, the natural fate of imperfection.

Nevertheless, after the abolition of the natural machines, and after facility in calculating by the new mental machines had been thoroughly established, the want of an absolutely certain, mechanical means of saving mental labor, and of eliminating psychical error, was widely felt by philosophers, and the first weak effort in this direction, which was after all a reaction, was a little instrument known as *Napier's Bones*.

One original source of error had been that the carrying of units to tens and of tens to hundreds, etc., was performed by the computer himself; the operation was not mechanical and was consequently liable to error. Napier's Bones merely dispensed with the use of the multiplication table, and reduced multiplication to simple addition; but the carrying was performed by the operator. Pascal, therefore, who devised a contrivance in which the operation of carrying was performed mechanically, may be regarded as the inventor of the first calculating machine. He had completed its construction in the year 1642, at the age of nineteen, and in a letter to the chancellor, Pierre Séguier, pointed out the advantages which were to be derived from its use. The instrument was the product of a long period of meditation and of experimenting, more than fifty models having been constructed before tolerable results were obtained. But Pascal's theory was far in advance of the technical art of his day, and his ideas never found full realisation; the chief cause of failure on the part of the mechanicians being their inability to overcome the friction of the parts. Copies of his machine are in possession of the *Conservatoire des Arts et Métiers*. The boldness of his views, however, were appreciated, and his plan formed the groundwork upon which a long line of mechanical philosophers from Leibnitz and D'Alembert to Babbage, Roth, Scheutz, and a host of others, have reared an astonishing superstructure.

Two of the most elaborate types of the modern calculating engine were made by the Swedish inventor, Scheutz; one of them which was exhibited in Paris in 1855, and was afterward bought for the observatory at Albany, is now in the observatory of the Northwestern University at Evanston; the second of these machines, afterward constructed for the English government, is now used for facilitating the calculation of the mathematical tables of the Nautical Almanac. This machine, which is of the size of a small pianoforte, not only calculates mathematical tables, but actually stereotypes the results in a form ready for printing. It *cal-*

culates and *stereotypes* two and one-half pages of figures in the same interval of time that it would take a good compositor to set a single page of the same figures.

THE MYSTIC HEXAGRAM.

The precocity of Pascal's genius was most distinctly marked in his geometrical researches. The story that he rediscovered the principal propositions of Euclid while a mere boy may be taken *cum grano salis*, but it is certain that the famous *Essay on Conics*, which was brought into public notice by Leibnitz after Pascal's death, was written in his sixteenth year. Unfortunately, a part only of the original essay was published, and the world knows the remaining contents only from Leibnitz's report. In this essay ap-

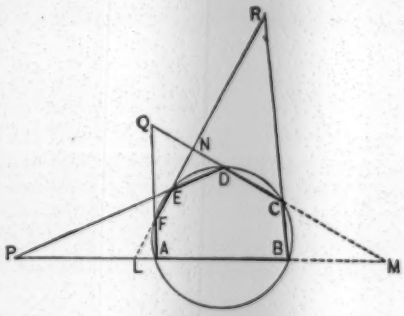


Fig. 1.
(From Beman and Smith's *Geometry*.)

pears the famous result known as Pascal's Theorem, viz., "that if a hexagon be inscribed in a conic, the points of intersection of the opposite sides will lie in a straight line." A special case of this theorem, and the one which is most popularly known, goes by the name of The Mystic Hexagram; it is that of a hexagon described in a circle. In the annexed cut (Fig. 1), if the inscribed hexagon *ABCDEF* be such that *BA* and *DE* meet at *P*, *CD* and *AF* at *Q*, *BC* and *FE* at *R*, then the points *P*, *Q*, *R*, are collinear; that is, lie in one straight line.

The wealth of content of Pascal's treatise was no less great than the methods which he employed were ingenious. Mersenne, who must be supposed to have seen the original work, remarks that from *a single theorem* Pascal deduced four hundred corollaries, which included all the results of Apollonius.

The last geometrical, and in fact the last mathematical, work of Pascal was that on the Cycloid, or the curve traced out by a point on a moving waggon wheel. It was produced during his period of religious seclusion, and owes its existence to eight nights of sleeplessness induced by a terrific toothache; it gives a tolerably full account of the geometry of the Cycloid,—reached by methods which, according to D'Alembert, form a connecting link between the geometry of Archimedes and the infinitesimal calculus of Newton and Leibnitz,—and suggests the thought that it would have been better for the world if Pascal had suffered from the same stimulating malady during the remainder of his natural life.

It remains to be noted that Pascal also left a fragment of a work which is the first modern attempt toward a philosophy of mathematics.

THE ARITHMETICAL TRIANGLE.

Pascal's researches in arithmetic and in the theory of numbers are most beautifully illustrated by his arithmetical triangle, which forms a conspicuous example of the close, logical interconnexion of the laws of mathematics generally. Pascal's arithmetical triangle was a magical key by which he unlocked the secrets of many problems; it is represented in the annexed cut, the construction of which is as follows (Fig. 2):[1]

The Arabic numeral 1 is first repeated in a given number of squares, say ten, in a horizontal line; the second horizontal line contains one square less, namely nine, the next still one square less, namely eight, and so on. The numbers which fall in the successive squares of each row below that of the first are the sums of the numbers in all the squares which lie over and to the left of that number in the horizontal line above; thus, in the fourth row the number 20 is equal to the sum of $10+6+3+1$, which are the numbers above and to the left of it in the horizontal row just preceding.

Let us see what are some of the consequences of this simple construction. The horizontal rows form what are called *figurate numbers;* the numbers in the first line are of the first order, that is, mere natural number-signs; the numbers in the second line are numbers of the second order, or the natural numbers proper, and represent the results of the *summation* of the numbers of the first order; the numbers in the third line are of the third order, or

[1] A somewhat similar table of numbers, but without the applications afterwards discussed, appeared in Stifel's *Arithmetica Integra* (1544); the fact has, however, no bearing on Pascal's researches.

triangular numbers, because if represented by points they can be disposed in the shape of triangles; the numbers in the fourth line are of the fourth order, etc. Again, the triangle possesses as many vertical columns as horizontal columns, and any column is the same as the correspondingly numbered row; thus running upward from 20 in the fourth column, we find the same numbers that we find in running to the left of 20 in the fourth row. Taking the diagonal rows we find that their sums are in geometrical progres-

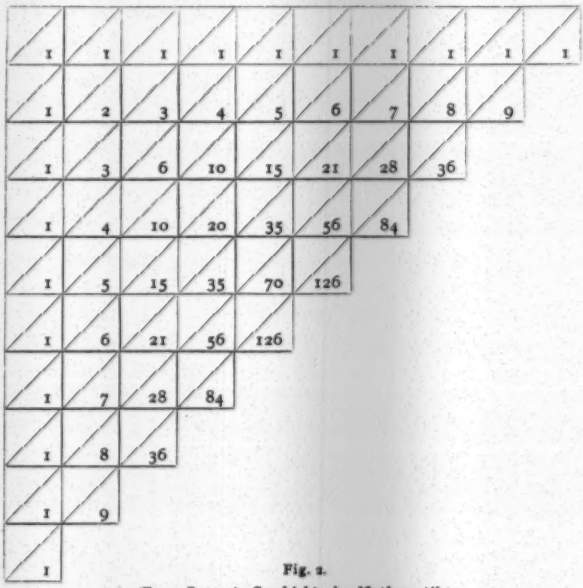


Fig. 1.
(From Cantor's *Geschichte der Mathematik.*)

sion, each being twice the preceding. These rows represent the successive powers of 2.

The arithmetical triangle was made to solve problems in the theory of permutations and combinations. For this purpose, the diagonal rows are used; these diagonal rows have remarkable properties.

We take the seventh, for instance; the figures 1, 6, 15, 20, 15, 6, 1, each show in how many ways six objects can be transposed,—first, when they are all alike; second, when five are alike; third, when there are two groups, one of four alike and one of two alike;

fourth, when there are two groups, each of three alike, etc. Any row, say the fifth, gives the coefficients of the expansion of the binomial $(a+b)$ to that power which is one less than the number of the given row—in the present case one less than 5, or 4, thus:

$$(a+b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4.$$

The coefficients of the expansion of $(a+b)^8$ are given in the ninth diagonal row.

The arithmetical triangle was also employed by Pascal for the solution of questions in the theory of probabilities, of which he and Fermat are the joint founders. The original problem was as follows:

"Two players of equal skill want to leave the table before finishing their game; their scores and the number of points which constitute the game being given, it is desired to find in what proportion they should divide the stakes."

Pascal asks first, How many games must each player win in order to gain the entire stakes? He then adds the two numbers so obtained, and seeks the corresponding base, or diagonal row, in his arithmetical triangle, in which column he adds together the numbers of as many squares as correspond in each case to the number of games to be won, and so obtains the sums representing the inverse ratio of equitable division; thus, if the first player lacks two plays to win, and the second four, the base is six; the sum of the first four numbers in this diagonal row is

$$1+5+10+10=26,$$

and the sum of the first two numbers in the same row is $1+5=6$; wherefore, the ratio required is 26 : 6.

We see in these results the unerring sense which Pascal possessed for detecting the *determinative elements* of a given mass of mathematical experience. The arithmetical triangle of Pascal is a rough, unhewn quarry-block, in which the polished mathematical statuary of Newton and the Bernoullis was potentially contained. The mere result of additions, it yet involves the consequences of complicated formulæ, and so offers many a fruitful philosophical lesson. Its study might be profitably pursued in elementary arithmetical instruction and made the basis of much inductive work. As a recreation, the study of its properties is to be preferred to the study of magic squares.

THE PHENOMENA OF LIQUID PRESSURE.

The achievements of Pascal in physics most popularly connected with his name relate to the phenomena of liquid and atmospheric pressure. The problems of hydrostatics, or the equilibrium of liquids, their transmission of pressure equally in all directions, early engaged the minds of natural philosophers, and the researches of Archimedes, Stevinus, and Galileo, virtually disposed of the question. Pascal's share in the work consisted principally in his application to the problem, of the principle of virtual displacements—the principle that the work performed by a small weight acting through a long vertical distance is equal to that of a large weight acting through a short vertical distance, if the products are equal. We shall mention first his ingenious experiments illustrating the increase of pressure with the depth of a heavy liquid.

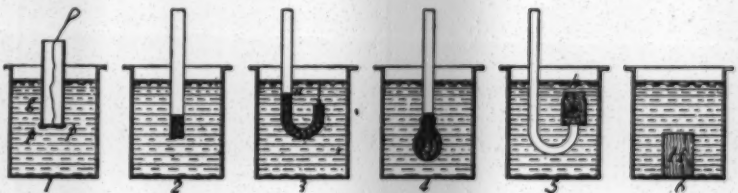


Fig. 3.

"In Fig 3, cut 1, is an empty glass tube *g* ground off at the bottom and closed by a metal disc *p p*, to which a string is attached. The whole is plunged into a vessel of water. When immersed to a sufficient depth we may let the string go, without the metal disc, which is supported by the pressure of the liquid, falling. In 2, the metal disc is replaced by a tiny column of mercury. If (3) we dip an open siphon tube filled with mercury into the water, we shall see the mercury, in consequence of the pressure at *a*, rise into the longer arm. In 4, we see a tube, at the lower extremity of which a leather bag filled with mercury is tied: continued immersion forces the mercury higher and higher into the tube. In 5, a piece of wood *h* is driven by the pressure of the water into the small arm of an empty siphon tube. In 6, a piece of wood *H* immersed in mercury adheres to the bottom of the vessel, and is pressed firmly against it for as long a time as the mercury is kept from working its way underneath it."

An ingenious illustration of a familiar mechanical principle is Pascal's Paradox. "A vessel *g* (Fig. 4), fixed to a separate support and consisting of a narrow upper and a very broad lower cylinder, is closed at the bottom by a movable piston, which, by means of a string passing through the axis of the cylinders, is independently suspended from the extremity of one arm of a balance. If *g* be filled with water, then, despite the smallness of the quantity of water used, there will have to be placed on the other scale-pan, to balance it, several weights of considerable size. *But if the liquid be frozen* and the mass loosened from the walls of the vessel, a very small weight will be sufficient to preserve equilibrium." The solution is that the *tiny* quantity of liquid lifted in any small displacement is forced *through the whole height of the narrow*

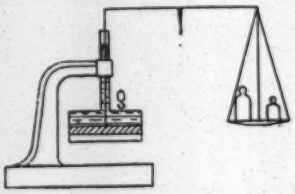


Fig. 4.

neck, while the *heavy* weights in the scale-pan move through only a *small* vertical distance.

THE PHENOMENA OF ATMOSPHERIC PRESSURE.

The action of pumps in raising water, the phenomena of suction generally, were attributed by the ancient philosophers to nature's abhorrence of a vacuum—to the *horror vacui;* and to this repugnance on the part of nature to emptiness in her domain there was supposed to be no limit. Imagine Galileo's surprise, therefore, on hearing of a newly-constructed pump, accidentally supplied with a very long suction-pipe, which was unable to raise water to a height of more than thirty-two feet. Galileo's immediate thought was that the *horror vacui* possessed *a measurable power*. His pupil, Torricelli, thereupon conceived the idea of measuring the resistance to a vacuum by a column of mercury. If the pressure which forced liquids into a vacuum was *definite*, then the mercury, which was fourteen times as heavy as water, would be raised to a column-height of only one-fourteenth of that of the water-column.

The prediction was confirmed by the experiment of Viviani.

A glass tube sealed at one end, filled with mercury, and stopped at the open end with the finger, was inverted in a dish of mercury so as to stand vertically, and the finger removed; the mercury stood stationary at a height of about twenty-eight inches.

Torricelli knew from Galileo's experiment that the air had weight, and he jumped to the conclusion that the column of mercury was balanced by the columnal mass of atmosphere superincumbent upon the free surface of the mercury in the dish, just as a weight of great specific gravity on one pan of a scales may be balanced by a bulky body of light specific gravity on the other.

Pascal, hearing a rumor of the experiment, reflected on it independently, and repeated it with the most beautiful variations—with wine, with oil, with inclined columns, with siphons, etc. But his chief merit was his establishing of the complete analogy between liquid and atmospheric pressure. He conceived the earth

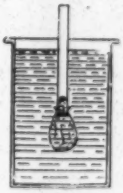


Fig. 5.

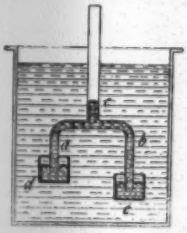


Fig. 6.

to be surrounded by an ocean of air, as the land is encompassed by an ocean of water. Every phenomenon which the new theory attributed to atmospheric pressure, he showed to have its analogy in liquid pressure. Into a deep vessel of water, a glass tube open at the top end to the air and having at its lower end a bag of mercury, is sunk (Fig. 5); as the tube descends the mercury rises by the pressure; as the tube rises the mercury falls. Why will not the same phenomenon happen in the ocean of air, if the distances of ascent be taken great enough to allow for the differences of density? Pascal requested his brother-in-law to perform the Torricellian experiment on the summit of the Puy de Dôme, a mountain in Auvergne. The mercury sank; the uses of the modern barometer were established.

"The invention of the barometer," says an eloquent writer, "is one of the most curious in the history of philosophy. No new discoveries, not even those first substantiated by the use of the tel-

escope, ever knocked so hard at the door of a received system, or in a manner which so imperiously demanded admission, as this one." And to Pascal, more than to any other, was due the merit of having overcome the prejudices of his contemporaries.

To clinch the new theory, Pascal mimicked the flow produced in a siphon by atmospheric pressure, by the use of water. "The two open unequal arms *a* and *b* of a three-armed tube *a b c* (Fig. 6) are dipped into the vessels of mercury *c* and *d*. If the whole arrangement then be immersed in a deep vessel of water, yet so that the long *open* branch shall always project above the upper surface, the mercury will gradually rise in the branches *a* and *b*, the columns finally unite, and a stream begin to flow from the vessel *d* to the vessel *e* through the siphon-tube open above to the air."[1]

* * *

Such, in the main, were the scientific achievements of Blaise Pascal. His wit, the graces of his style, his theology and philosophy, have entered literature, and may be found in its dusty tomes, in all their pristine brilliancy, by those who have the desire to seek them. But his scientific achievements have entered life, the life of all nations, and remain there,—silent and unfelt, but none the less puissant in their eternal presence.

[1] Figures 3, 4, 5, 6 and the quotations accompanying them are from Mach's *Mechanics*.

CHINESE FICTION.

BY GEORGE T. CANDLIN.

[CONCLUDED.]

BUT now let us give our readers a change. We are tempted here to let a bit of our secret peep out and tell them at once that Chinese fiction broadly divides itself in our mind into a three-fold classification; the historic, the mythic, and the sentimental. History, under the potent spell of that mighty magician, the imaginative faculty, shades off on the spiritual side into the formless region of myth, where man vainly tries to express the mysterious and inexpressible side of his nature, and on the other side melts into the sentimental, where he finds happy play for its human side.

Now of the mythical novels we have four specimens on our list—*The Exorcising of the Devils*, *Diversions of a Studio*, *The Apotheosis of Spirits*, and *The Western Excursion*. This is a very important branch of Chinese fiction and is the fountain-head to which you must go if you would explore the folk-lore of the East. And it is only by knowing this that you can get at the roots of that inextricably twisted jungle-forest of superstition which chokes and shadows the Chinese mind. *The Exorcising of the Devils* is a kind of *Jack the Giant Killer* allegory. *The Diversions of a Studio* is a collection of short stories, something in the line of the Arabian Nights, where magical transformations and scenes of glittering enchantment abound, but all on the hypothesis that foxes constitute an intermediate order of being between the human and the demoniac, and that they assume at will the form of beautiful men and women. Their appearances are always sudden, like that of fairies, and, like fairies, they come with rich gifts, ut intercourse with them is baneful. The book is exquisitely written in the most refined classic style, but as there is a translation we will say no more about it. About the third one we will say nothing at

all, because we have not read it. We will take the *Shih Yu*, The Western Excursion, as our type of the mythical novel.

Every one knows of the journey of Shuen Tsang to India to seek the Buddhist Canons. It was a journey full of danger, hardship and marvel. The author of our story is said to have made a similar journey in Mongol times. However that may be, he has used Shuen Tsang's pilgrimage as the foundation on which to build a superstructure containing all the most noted myths of Buddhist and Taoist beliefs. It is at the same time an extended allegory of a very subtle character, running into spiritual meanings of the first and second and even the third degree. Shuen Tsang is supposed to be the brother of one of the T'ang emperors who had become a priest, and who made a pious vow to perform the journey to India and fetch the holy books. But as there are always difficulties in the good man's path, he soon finds that this is no holiday excursion, but quite another guess matter. As soon as he begins to turn his steps westward his way is obstructed by the most unexampled hindrances. There are giants that want to eat him up and sorceresses that would fain betray him. He is put to it most sorely, for all the nether regions seem astir to prevent his progress. But on the other hand the celestial powers are propitious, and by dint of giving him some most marvellous travelling companions, and frequent interferences from the goddess of mercy herself, he is kept scatheless. Even the imperial sovereign of the skies, the great Yu Huang, is deeply interested in these bustling affairs. The first thing he knows he is caught up and swept off on the wings of a whirlwind by a beautiful enchantress who would have him as the companion of her bower, and his protectors have the most unheard of trouble to get him out of her clutches. He finds a betrayed maiden weeping sore in the forest, buried up to her waist in the earth, rescues her by the aid of his travelling companion, and takes her with him to the nearest monastery, full of pity for her distress. But this lovely maiden is a complete fraud, as like Armida in fact as you can expect any one woman to be like another. Sun Shing Che, his right-hand man, is at his prayers at midnight, when she steals on him and assails him with the most seductive arts. But he is a deep, suspicious customer, and has been all along persuaded that there is something wrong with her. He is not to be cajoled, but in the twinkling of an eye he finds her transformed into an Amazon of fearful might, vomiting smoke and fire, and wielding a magic sword of preternatural sharpness. In fact, you soon begin

to see that this is a *Pilgrim's Progress* and a *Faerie Queene* all in one.

This Sun Shing Che is himself a most wonderful being. The author has so far anticipated the Darwinian theory, or rather Bishop Wilberforce's jocular description of it, as to derive his origin from a monkey. He has been immortalised by the gods, and in virtue of necromatic study, is gifted with extraordinary powers of levitation, by means of which, like Puck, he can "put a girdle round about the earth in forty minutes." He has another trifling accomplishment in the way of being able to transform himself at will into the form and faculty of any member of the animal or insect kingdom. He has had escapades in the heavenly regions, such as stealing the golden peaches of Paradise, and letting loose the steeds of the immortals. A burly, humorous, infinitely mischievous kind of Puck. He is a champion to one's mind, wielding an iron staff with golden bands, which he got out of the sea-dragon's cave under the ocean, which was several thousand catties in weight originally, but which he judiciously reduced by a few hundred catties, so as to make it handy. When he finds it inconvenient to carry, it can be diminished to the magnitude of a needle, which he sticks in his ear. With a travelling companion like this and two or three others, notably one who fights with a rake, the devout pilgrim has a good prospect of getting through.

Many, however, are the risks they run, and most various the inducements held out to them to abandon the object of their pilgrimage. Here is a specimen of their adventures.

They are treading their way westwards through green hills and shining waters, where they behold an endless luxuriance of vegetation, and where flowers of every hue abound. But the way is long and evening draws on apace, so the chief pilgrim puts the somewhat human inquiry, "Where shall we go to rest for the night?" The reply of Shing Che is in the most approved style of pious devotion, but not comforting to flesh and blood:

"My father, he who has left home and become a priest must dine on the wind and lodge in the water, lie down under the moon and sleep in the frost; everywhere is his home, why then ask where shall we rest?"

This is all very well for our lightsome Puck, but Pa Chieh, who is the burden-bearer and carries the pilgrim's baggage, which is not inconsiderable, regards the division of labor as unequal; and at any rate would like some more matter-of-fact arrangement for the night. At a blow from Sun Shing Che's staff Shuen Tsang's

horse has started forward at a great pace, so that from the brow of a hill Shuen Tsang espies in the distance a grove of cypress trees, beneath the shade of which is a large enclosure, which they decide to make for as a place of rest. On approaching it they find that it is all that heart could desire, in fact a spacious establishment of some magnificence, as near a palace as they can expect to come at in those regions. As there is no sign of inhabitants, Shing Che makes his way inside, and finds that it offers very attractive quarters. While he is looking round on black varnished tables and gilded pillars a large scroll meets his eye on which the motto is certainly inviting: "Gentle willows hung with floss, and on the bridge the level sun at eve. In snowy flakes the scattered bloom has filled the court with spring."

While he is examining this, a lady about middle life, but of very charming appearance and bearing, steps into the court from an inner room with the inquiry, "Who is it that has ventured to intrude upon the household of a widow?" In truth according to Eastern etiquette he is in an embarrassing situation. But the lady is most affable, and as he explains their condition, cordially invites them in to rest for the night. They all enter, and Pa Chieh, who is by no means beyond human infirmities, casts more than one sly glance at the lady, whose attractions are thus described in rhyme:

> "The clouds of hair upon her brow aslant like phœnix wings,
> And set with many a precious pearl her pendant earrings.
> No artifice of 'paint' she needs her natural charms to aid,
> Yet gay and winsome is she still as any youngest maid."

The natural way of opening acquaintance is by describing their respective circumstances, and on her part the widow lady tells them that she has been left in possession of riches in abundance, her husband's parents having died as well as her husband, leaving her in charge of three beautiful daughters with three very pretty names—Truth, Love, and Pity. There is nothing like a Chinese novel for a surprise, and our private opinion is that the holy pilgrims were taken at a disadvantage of an unwarrantable kind, when the lovely widow made a plump proposal to them, not simply on her own behalf, but also on the part of her daughters three, and in a very business-like way pointed out the advantages the four pilgrims would derive from a quadruple marriage, which would secure to each of them a charming wife and store of wealth for the rest of their days. In fact, in her view they cannot do better than finish their journey here and be "happy ever afterwards." Inducements are manifold. She has mountain lands for trees and fruit,

and broad fields for grain, and flooded fields for rice, and of each kind more than five thousand acres. She has horses and oxen, pigs and sheep beyond all count, and farmsteads some sixty or seventy, on her vast domain. The grain of a dozen years is rotting in her granaries for want of eating, and mountains of silks and satins are being moth-eaten for want of wear. As for silver and gold, if the four pilgrims should turn prodigals they could not contrive to spend it in a lifetime. Prosperous Job himself was but a portionless beggar compared with her. To say nothing of herself and her lovely daughters, and though she is becomingly modest about her own attractions, they are not only the most surpassingly beautiful but the most completely accomplished of living maidens.

All this Shuen Tsang hears unmoved except by anger, not suspecting her guile but enraged that she should so tempt him from his heavenly purpose. Then ensues a contest between the lady and himself, of which we had hoped to offer our readers a translation, but no ingenuity we can command will avail to twist it into presentable English verse. The respective advantages of a life of worldly ease and of celibate devotion are sung by the two champions, and at the conclusion of the wordy contest the lady, finding her persuasions futile, angrily retires, slamming the door on them and leaving them seated in the hall disconsolate and unprovided for. During this scene the covetous Pa Chieh has taken another view of the situation. He would have been glad to close with the widow's terms, but seeing that may not be, he steals round to the back and secures a private interview, in which he seeks to arrange a marriage on his own account. Certain difficulties arise, mainly on account of his lack of masculine attractions, for as Sun Shing Che wears a monkey's form, so he wears a pig's, and his long face and big ears are objectionable. But the lady is not altogether uncompliant. She is at once so far mollified as to provide for the entertainment of the travellers, and in the meantime, through the prescience of Sun Shing Che, Pa Chieh's clandestine interview is made known to his chief. They thereupon, after sundry passages between them, insist upon his retiring within the household in the character of a son-in-law, the other three remaining merely as guests in the guest-chamber.

But now a new difficulty of a knotty kind starts up. The widow is apparently willing to give him one of her three daughters to wife, but for the life of her cannot decide which is to be the favored one. If she weds him to Truth, Love will feel neglected, and if to Love or to Pity, Truth will naturally feel aggrieved. In

this dilemma, or rather trilemma, a very cunning expedient occurs to her. She proposes to blindfold him with a handkerchief and then turn the three girls in on him and let him have whichever he can catch. Perhaps it was a supreme proof of courage, though not of discretion, for Pa Chieh is quite willing to do wittingly what many a man has had to do in real life unwittingly—play at blind man's buff for a wife. Yet as all three were consummately beautiful and accomplished, his chances could not be said to be so bad.

But alas! this was only another of those "best laid schemes" destined to "gang a glee." The bandage was tied over his eyes, he found himself groping in darkness, the tinkling sound of female trinkets was all around him, the odor of musk was in his nostrils, like fairy forms they fluttered about him, but he could no more grasp one than he could clutch a shadow. "Right and left, to and fro, he groped and fumbled. More female forms than he could count were round him, but in vain he thought to hold one. One way and another he ran till he was too giddy to stand, and could only stumble helplessly about. Eastward it was a pillar he embraced, westward he ran against a wooden partition, forwards against the leaves of the door, backwards into the wall, bumping and banging, head and heels, until with swollen tongue and bruised head, he could only sit down panting."

Thus reduced to a state of mingled exhaustion and imbecility, he was fain to seek a parley, for, as he expressed it, they "were much too slippery for him." Then his mother-in-law by anticipation unloosed his bandage and gently broke to him the intelligence that it was not their slipperiness but their extreme modesty which had prevented a capture, each of them being generously wishful to forego her claims in favor of one of her sisters. In fine, it was the old story, so true also in real life, that a lady is extremely difficult to catch when she is unwilling to be caught. Upon this he becomes very importunate and urges his suit in a most indiscriminate fashion for either one of her daughters, or for the mother herself or for all three or all four. This is beyond all conscience, but as an escape from their perplexity, the widow proposes a new criterion of choice. Each of her daughters wears a certain garment, an inner vest, embroidered in jewels and gold. He is to be allowed to try on one of these, and, in case he can get it on, he is to marry the lady who owns it. He consents, only modestly stipulating that he shall have a try with all three and succeed according to his deserts. There is no difficulty as to size, for, as most people know, all garments whatever in China would be roomy enough for Go-

liath. The good lady brings one in and he finds that one enough, for no sooner has he got it on, just as he is tying the cord round

A CURIOUS GAME AT BLIND MAN'S BUFF.
(From an illustrated edition of the *Shih Yu*.)

his waist, than it transforms itself to strong bands of rope wound round every limb. He rolls over in excruciating pain, and as he

does so the curtain of enchantment falls and the beauties and the palace disappear.

Next morning his three companions wake up, also to find the scene changed. "As the east shone white they opened their eyes and raised their heads, only to see that the great mansion and lofty hall, the carved beams and ornamental pillars had all disappeared, and they had been sleeping all night on the ground under the cypress grove."

But where was their errant companion, the eager bridegroom of the adventure? After a short search he was found bound fast to a tree and yelling with pain. They cut him down bruised and crestfallen, to pursue the journey sadder but wiser, and subject to many a gibe from his mischievous companions.

Or as a specimen of the marvellous play of imagination which this book affords, take the episode of the burning mountain. The pilgrims find it getting hotter and hotter as they proceed, and on resting for the night at a village by the roadside are told that they can go no further in that direction, as there is an enormous mountain in their path all on fire which reduces the whole region to sterility and which they can neither cross nor get round. Our active lieutenant and man of all work, by the simple expedient of questioning a vendor of pulse at the door, learns that the only way to deal with this obstacle is to obtain the loan of a certain palm-leaf fan, *made of iron*, which will put the fire out. It is in the hands of the iron-fan fairy, who dwells in a palm-leaf cave on a mountain called Ts'ui Yun San, Beautiful Cloud Mountain. It is fifteen hundred li away. "That is of no consequence," says Wu Shing Che, and before you can wink he was there. But he finds it no such simple matter. This fairy, called also Lo Sah, is wife to the ox-demon king, and a female of an uncertain disposition. Besides, while she is a sort of aunt to our doughty adventurer, he suddenly recollects that she has an ancient grudge against him, and it is more than likely that she will not put this indispensable fan at his disposal. However, he goes on the principle that "faint heart never won fair lady," and puts a good face on the matter. The old lady is distinctly pugilistic, and they turn to with sword and staff and have a royal battle there on the mountain. Sun Shing is likely to get the better of her, but she lends him the use of the fan in a sense he did not anticipate. She gives it one wave, and to his amazement he is blown on the breath of a hyperborean hurricane, against which he is helpless, and alights only by holding hard on to a rock by both hands, fifty thousand li away, being

THE QUENCHING OF THE BURNING MOUNTAIN.
(From an illustrated edition of the *Shih Yu*.)

lucky to stop at that. Here he is helped by a friend, who gives him a pill which he is to swallow, and then he can stand comfortably in the strongest wind that ever blew. Away he hies back, and this time the fan waves in vain. Then the old woman retires inside and slams the door on him. He turns into a bee, flies through a crack of the door, and after a most surprising battle gets the fan and makes off with it like lightning.

So now he will succeed, he thinks, and he will show his companions how it is done. They go as far toward the mountain as they can for the heat and flame. Then "Shing Che raised the fan, and advancing near to the fire waved it with all his might. At the first wave the blazing fire of the hill burst forth with intense heat. At the second wave it increased a hundred-fold. He tried a third, and the flame rose at least ten thousand feet high and singed all the hair off his legs before he could get back to Shuen Tsang. He cried out, 'Back! Back! Fire! Fire!' Shuen Tsang mounted his horse, and they all had to run for their lives."

Here's a pretty kettle of fish. The old aunty has played him a jade's trick. She has cunningly given him the wrong fan. We have no time to follow it in detail. Amongst other things, he learns, for there is deep symbolism here, that this fire-flaming mountain was kindled by himself, goodness knows how long ago. But he is not to be beaten. He personates the old lady's husband, who is playing truant with a younger fair, and goes through a very sentimental scene with her in this character, not, however, passing the bounds of propriety, if you remember the maxim, "All's fair in love and war." By this treacherous device he worms the secret out of her, and finds that the right fan, the genuine article, is a little thing, the size of an apricot leaf, but which can be magnified by touching a point in its stalk into twelve feet long. This he gets and again makes off. However, the ox-demon king is on his track, and as personification is a game at which two can play, he appears in the guise of Sun Shing's companion offering to carry the fan, which, that worthy having magnified, he does not know how to minimize, and on its being handed to him makes away back to the cave with it. Now Sun Shing's blood is up, and after a tremondous fight he gets final possession of it, and is once more before the mountain with his companions. In the meantime the "machinery" is invoked, various celestial beings are on the scene waiting for the "all-important event," and after due ceremonial "he took the fan, swung it one wave with all his might, and that fiery-flaming mountain slowly settled to rest, and the blaze went out.

Shing Che, greatly pleased, fanned one more stroke, and softly sighing winds began to move; at the third wave over the whole

THE STEALING OF THE MAGIC FAN.
(From an illustrated edition of the *Shih Yu*.)

heavens the clouds gathered dense, and the gentle rain fell thick and pattering."

Scandinavian legends and Thor's journey to Jotunland cannot surpass this.

We have now only the sentimental novels to deal with. Of these there are seven on our list, but their characteristics must be summarised. The best known amongst them, either to foreigners or natives, is the *Dream of the Red Loft*. We are not ourselves enamored of it; there are some pretty sentimental songs in it, but a weary lot of tiresome repetition of trivial details. Its recommendation to foreigners is that it is full of conversations in first-rate Pekinese; but if aristocratic life in China is anything like this picture of it—dressy, vain, empty, proud, idle, sentimental, licentious—it is a wretched existence.

Seeking a Match is a very surprising story, and affords the most graphic representation of the wiles and tricks of the unscrupulous Celestial to be found anywhere. The *Western Room* and the *Guitar* are the work of great artists. They are called novels, but are dramas of the operatic kind, the dialogue only being prose.

By a sentimental novel we understand one the subject of which is love, but as the marriage laws in China differ from those in England, our notions on this head get a rude shock. In a certain sense the Chinese novelist may be said to enjoy a great advantage over his brother artist of the West. When, for instance, as in one of these stories, a remarkably smart Chinese girl who is sued by an unwelcome lover, has cleverly contrived to juggle the engagement document, which a treacherous uncle has compelled her to write, and to put in the name and age of her cousin, who is plain-looking, to take her place on the wedding day, so that the unwelcome suitor is successfully married to another girl; you would expect that to be the end of the matter, and that the author had nothing for it but to bring in the right bridegroom, marry the heroine according to her heart's wish, and make them "happy ever afterwards." But the Celestial novelist is in no such straits, because the villain of the piece, though a good deal disgusted at being so tricked, need not in the least change his purpose. Having one wife, in a country where there are no laws against bigamy, does not preclude his having another, and thus his author is at full liberty to conceive a whole series of ingenious schemes and to amuse us with the story of their frustration.

Or again, where a young man is already engaged, and strangely enough a young lady disguised as a youth proposes to him on her own account, and he on his part is honest enough to tell her of his engagement, you would think that enough to discourage the

maiden. By no means. She readily signifies her willingness to accept the position of number two, and though we might think this somewhat lowered her dignity, we see the disparity of ethical standards when the author represents this as a supreme act of nobleness. Chinese heroines, by the way, are fond of assuming the masculine disguise.

We learn from these stories that the supreme height of ambition is to become a Chuang Yuen, that is, the first on the list for the Han Lin, which is the highest degree in the Government examinations. There is only one every two years, so its possessor is covered with unheard-of glory. He has plucked the "red olive spray" and is the man the Emperor himself "delighteth to honor." He is courted, caressed, famous, wealth showers in on him, beauty languishes at his feet, and he can have as many sweethearts as he likes, and marry them all when he pleases.

This class of novels is very extensive, and ranges from beautiful stories, told with unaffected simplicity and grace down to shady compositions which you can only compare with Boccaccio and Smollett. It seems to be the general belief that Chinese novels are peculiarly impure, that in fact they have no innocent novels. Stent, in the preface to his dictionary, tells us that he wanted to translate one, but "found none that he thought readable in English from the subject being utterly absurd, filthy, or childish, in fact untranslatable." To this one is bound to say he had read little or chosen badly or was a poor judge. Of the fourteen novels on our list six are so entirely innocent that they might be translated almost verbatim for a child to read, and not one of them is worse than Fielding's *Tom Jones*, which Macaulay, who will hardly be accused of low taste, declared to be the best novel in the English language. There are bad novels in Chinese, which far be it for us to defend, books to which we might well apply the saying of Carlyle concerning a novel of Diderot's, "if any mortal creature, even a reviewer, be again compelled to glance into that book, let him bathe himself in running water, put on a change of raiment, and be unclean until the even." But, on the other hand, we cannot afford to give way to a squeamish affectation which would compel us to close our Shakespeare.

It is a proof of the high degree of elaboration to which fiction literature in China has been carried, that most of their novels are thickly interspersed with poems of all orders of merit. No stronger evidence could be afforded of the fact that, whatever they lack, it is not literary finish. If anything, they have this in excess. These

poems are introduced in a variety of ways. The hero sends one in a *billet-doux* to the heroine, or he overhears her singing one, or perhaps a poetic contest is struck up, the fine on defeat being generally the compulsory drinking of so many extra flagons of wine. Wine-drinking and poetising almost invariably go together in Chinese novels, though whether they do so in real life we are unable to say. Above all things, every man who sets up to be anything in the way of a hero in Chinese fiction, must be prepared to extemporise by the ream in inimitable poetry.

Some attempt, however brief, to set forth the characteristics of this poetry should be made.

The treatment is very conventional, partly because the Chinese poet has had before him no great variety of models and partly because he is bound by mechanical fetters compared to which the most difficult Western verse is licence itself. It is nothing to see him make the same rhyme in from six to a dozen consecutive lines, and the laws which govern metre are indefinitely more complicated than our own. A favorite method is to rhyme the first, second, and fourth lines, leaving the third without any rhyme at all. This seems to have a peculiar charm for the native ear, though we have never been able to appreciate it.

There is an exasperating tendency to repeat over and over again the same succession of images. Indeed we do not know what the Chinese poet would do without his "spring winds" and "autumn moons" or if forced to speak of ladies' eyes as anything else than "autumn waves," their hair as anything other than "raven-clouds" or of their feet, crippled with bandaging to the bewitching measurement of two inches, as anything but "golden lilies"; and the hairs of his pencil would stand awry with dismay if you robbed him of his chrysanthemums and peonies, his cinnamon, peach, and plum, his willows and poplars. Even these calamities, however, are light compared with the wild despair which would fill his soul and reduce his muse to dumbness if some barbarian sportsman should recklessly shoot that darling phœnix, without which poetry could not be written, or exterminate his dragons, cranes, gibbons, his swallow, cuckoo, and oriole, and that ubiquitous pair of mandarin ducks which used to adorn the surface of English cottage dinner plates.

The only vein of feeling which the Chinese poet seems to have succeeded in giving adequate expression to is melancholy. We have never seen in Chinese poetry a pure gush of fresh and genuine delight. When they try to express pleasure they aim to be

funny, and generally end in a clumsy and coarse burlesque. A Chinaman is coarse in his pleasures, and only sadness refines him.

Yet these poems often contain exquisitely beautiful and gracefully simple language, while there is no speech in the world which can approach Chinese for terseness of expression. It is not easy to put into fourteen English syllables what the Chinese poet expresses readily in seven. The *Dream of the Red Loft* contains about the best of these sentimental poems which we have seen.

一憔淚若胭侍天樹桃凭閒風花桃東簾桃
聲悴眼將脂女擬樹花攔苔透解花風外花
杜花覷人鮮金燒烟桃人院簾憐簾有桃簾
字遮花淚豔盆破針葉向落攏人外意花外
春憔淚比何進鶯一亂東門花花關揭簾東
歸悴易桃相水聲萬紛風空滿也仍簾內風
盡人乾花類來錦株紛位掩庭愁舊攏人賴

寂花淚淚花香春烘花茜斜庭隔簾花人挑
寞飛乾自之泉酣照綻裙日前簾中欲與花
簾人春長顏飲欲樓新偷闌春消人窺桃簾
攏倦盡流色熙醒壁紅傍干色怠比人花內
空易花花人胭移紅葉桃人倍風桃簾隔晨
月黃憔自之脂珊糢凝花自傷吹花不不妝
瘦昏悴蝸淚冷枕糊碧立凭情透瘦捲遠懶

Some of the dramatic novels especially are of surprising artistic merit. Our own particular favorite is the *Guitar*, which ought to be put into English. For simplicity, naturalness, and pathos, it is exquisite. How T'sai Po Chieh's father would have him go to the capital to get his degree, while his fond mother would keep him at home, and the wife, just past the honeymoon, is divided between love and duty, but consents for him to go. How he is away long and there is no news, and famine comes, and they have nothing to eat, and the daughter goes sadly on distribution days to re-

ceive the pittance which government is doling out to the famishing. How there is no grain in the granary and the little given to her is stolen from her on her way home. How mother suspects her of eating good food in secret and giving them bad, whereas she has eaten her meals alone because she had nothing but chaff to eat while they were complaining of better food. How father dies, then mother, and she is alone and helpless, but cuts off her hair and sells it on the street to buy a coffin, and scoops the grave with her own hand, carries the earth to cover them in her apron, then, worn out with hunger and exertion, she goes off to sleep. Then the spirit of the mountain region comes to her in her dream, whispers good cheer, and tells her heavenly guards attend her, and she is bidden to take her guitar and beg her way to the capital, where she shall find her husband. All the pathos of desertion is in it; it is a thing woven out of tenderness and sorrow.

Meanwhile the other side of the picture is skilfully contrasted with this. The husband, the Chuang Yuan of his year, fêted, feasted, courted, and a great general, Niu, will have him as husband to his only child. His refusal is set aside by the Emperor himself, and against his will he is married to the matchless beauty; but in the bridal chamber he is haunted by the thought of his absent parents and wife. The motives of the actors are different from those by which we should be swayed and the hero's course of conduct different from that which a noble Englishman would pursue in a similar situation; but we must take the author's reading of the customs and sentiments of his race, and then we shall see that he has combined his scenes and characters with surpassing skill.

We have attempted a rendering of a somewhat extended scene with which we hope our readers will not be too impatient. The portions we have put into blank verse to correspond with the original should rhyme, but the work of translation was too difficult, and we have sacrificed everything in order to give, as literally as might be, the matter, not the form, of the original. We must also ask our readers to remember that this drama is operatic, which must account for the characters addressing the audience, when, as we should think, they ought to be speaking to one another. Let our readers bear in mind the position of the bridegroom in this scene. He is remembering his first wife and duty while in the presence of his second wife and pleasure.

An inner court. [*Enter bridegroom.*]

Bridegroom—

The court with shade of locust trees is thick,
And odors of the lotus weight the screens.
How shall I pass this never-ending day?
By leaning idly on the balustrade,
Or spreading out my mat of Shiang make
And dreaming of the hills about my home
Till graceful bamboos flirting in my face,
Or else the wind shall startle me from sleep?
Those waving boughs seen on the water's face
Show like to golden palaces. The screens
Reflect the deep green shade of this lone place.
The day is long, with naught to do but sigh.
Though pleasant wine invites from fragrant flask,
I feel too idly sad to pour and drink,
But, ruminating with my bitter thoughts,
Remember how the year has passed away
And yet no tidings come of those I left.
Life is but such a year that hurries man
With swift exchange of cold and heat to age.
I'll tell my sorrows on my jewelled lute.
Ho, there, attendant! bring my lute and music book.

[*Enter attendant.*]

Attendant—

A yellow scroll to while away the time
And a harp to play to the passing breeze.
Sir, here are your lute and your book.

Bridegroom—

Call my two study pages.

[*Enter two boys.*]

Boys—

From earliest childhood we've been trained
To keep the study neat;
A pleasant life indeed, say some;
We think it not so sweet.
For oh! 'tis weary waving fans
And burning incense still,
And by the flow'ry arbor sides
The fierce east wind is chill.
And then there's nothing else to do
But daily meals to keep;
And, after we can no more eat,
To go to bed and sleep.

Bridegroom—

The day is pleasant with its cool, fresh air
I'm sitting here alone with naught to do

I'll take my harp and practise at some tune
To chase away my melancholy thoughts.
You three employ yourselves: one take the fan,
And one burn sticks of incense in the court,
The third may put the books in order for me,
And none of you be idle at your task."

All—

"We understand sir!" [*Bridegroom plays.*]

Bridegroom—

"That I may greet the strings auspiciously
I sit and face the perfumed south and play,
Yet conscious am I that, beneath my fingers,
The music has another meaning from of old.
For all the running streams and lofty hills
Before my eyes seem blown by evil winds:
So they showed gloomy when I left my home.
At every pause th' expression turns to grief,
The wail of widow'd swan or lone gibbon,
Or like the phœnix parted from his mate.
Ah me! why does the sound of death hang on the string?
As 'twere a mantis killing cicadas.
In heaven's blue field the sun is clouded o'er,
So when King Wang turned to a cuckoo bird
Bright marriage omens turned to evil fate.
The sweet sounds that I look for fail me now,
They're broken strings that cannot be pieced out.
[*To his attendants.*]
The lady is about to come forth; you must all retire.

Attendants—

"We attend, sir!" [*Aside.*] "Just so, the fortunate have men to wait on them; the unfortunate must wait on men." [*Exeunt attendants.*]

[*Enter bride.*]

Bride—

"The tenderest green shows in the tanks of flowers
Round which the fumigated air is playing,
And glimpses of the bridal chamber show,
With nursling swallows flying round its roof.
The flowered mats are spread and cool silk screens,
There's song from golden strings, the goblet's warm,
And happily the fierce heat cannot strike
Within this cool pavilion with its waters.

DIALOGUE.

Bride—

So you are here, sir, practising on your lute?

Bridegroom—

Yes, I had nothing to do, and I thought I would amuse myself in this way.

Bride—

I have heard before that you are a most skilful musician. But why come away

where the sounds of silk and bamboo spend themselves on vacancy, unheard by other ears than your own? I count this a lucky day on which I have heard you practising. May I not make bold to ask that you will play me one more tune?

Bridegroom—

You would listen to the lute, lady? What tune would you like me to play you? What say you to the "Pheasant's Morning Flight?"

Bride—

No, do not play that. That is the song of one who was wifeless.

Bridegroom—

Then what do you say to "The Solitary Bird, the Widowed Swan?"

Bride—

What! Just when husband and wife have been newly married, you would sing of loneliness and widowhood?

Bridegroom—

Well, then, for want of anything else, I will play "Prince Chao's Complaint."

Bride—

Now, of all times, when we are at the height of married bliss, you would sing of grief in a palace? Oh, sir, all the beauties of summer are around us. Play me the tune "The Wind Through the Pines."

Bridegroom—

Very well. As it suits you. [*He plays.*]

Bride—

Stop, stop! You are mistaken. How is it that you play "Thoughts of Home?"

Bridegroom—

Hold a moment! I will play it again.

Bride—

Oh dear! You are wrong again. Now you are playing "The Crane's Lament."

Bridegroom—

Indeed I have again played wrongly.

Bride—

Sir, how is it that you contrive to play wrong every time? It must be that you are making fun of me on purpose.

Bridegroom—

How should I have such an intention? It is this lute string that I cannot use.

Bride—

Why cannot you use it?

Bridegroom—

I have only accustomed myself to play with the old string. This is a new one and I am not familiar with it.

Bride—

What has become of the old string?

Bridegroom—

The old string has been cast aside long since.

Bride—

Why did you cast it aside?

Bridegroom—

For no other reason than that I had the new string and had to cast aside the old one.

Bride—

But now, why not reject the new string and use the old one?

Bridegroom—

Lady, do you suppose I do not think of the old one? Only this new string I cannot cast away.

Bride—

Well, then, if you cannot cast away the new string, why think of the old one? Ah yes, I have it. Your heart is elsewhere and therefore all this idle talk.

Bridegroom—

Lady, the old chord is like to break,
And the new chord I cannot use:
'Tis hard the old chord again to take,
And as hard the new chord to lose.
I'll try once more,
I'll try once more,
And once more the notes I confuse.

Bride—

Sir, your heart is changed.

Bridegroom—

My heart has known no change,
But strangely this cool day,
As soon as one tune strikes your ear,
'Tis changed by the wind to a different lay.

It comes out all right after all; the suffering heroine finds her way to the capital, the stern general relents and acknowledges her claims, special honors are bestowed all round by the Emperor in recognition of their several virtues, and the only drawback is that the husband has two wives instead of one on his hands, which he bears with equanimity.

Here is a rhyme we would like to give our readers from the *Western Room*. The speaker sees in a cloudy but moonlit night the

雲水風香離閒
欹輪姊階恨愁
睛乍殘亂千萬
空湧紅擁蜷種

reflexion of his own melancholy mood. It is almost impossible to do anything but parody it in English:

The clouds enshroud in gloom the eyes of space,
The moon in bursts her watery circle shows,

The wind sweeps up the broken blossoms red,
Which on the steps in fragrant heaps it throws:
Resentful I, with thousand cares oppressed,
And my sad heart is thronged with myriad woes.

Here is a Chinese love song, the *Song of the Harp*, which we are told the player did not sing, but the harp seemed to say it, being played so skilfully:

有美一人兮
見之不忘
一日不見兮
思之如狂
鳳飛翱翔兮
四海求凰
無奈佳人兮
不在東牆
張琴代語兮
欲訴衷腸
何時見許兮
慰我傍徨
願言配德兮
攜手相將
不得于飛兮
使我淪亡

She is a sweet girl,
See her and love;
One day without her
And mad you'll prove.

The phœnix soars far
Seeking his mate,
But my sweet fellow
In vain I wait.

Come, harp, speak for me
Tell all my heart,
When will she pledge me,
Bid fear depart?

I must her worth tell,
Join hands for aye,
Be her companion
Else pine away.

Or take this very melancholy one, expressive of the loneliness after parting and offering a succession of graceful but gloomy images. The translation attempts to reproduce a peculiar duplicated use of epithets which is most common in Chinese poetry:

Drooping, drooping, the green willow, half-screened by the wall from sight;
Lone, lone, the silent doorway, close-barred on clear autumn night;
Sharp, sharp, far-sundered tree-tops drop their leaves before the wind;
Far, far, and sad the moon peeps from the cloud's edge through the blind;
Grand, grand, the bamboo shadows, writhing, move like dragons, snakes;
Floats, floats, the empty vision of butterflies which "chuang tzu" makes;
Clack, clack, the weaver-cricket beats incessant, wearisome;
Sad, sad, the measured echo of the wash-stone's dismal drum;
Dire, dire, the pain of parting, sadder than all these sad things;
Burns, burns, the impatient fever, as my happy dream takes wings;
Lone, lone, and cold I sigh; tears, tears, fall tenderly,
For my sweetheart, where is she?

But we must close these wanderings in the field of Chinese romance. We will do so by asking the reader to join us in the conclusion that our friend John Chinaman is a being not lacking in imaginative faculty. One cannot help respecting a nation so rich in literary treasures, cannot help feeling a likeness of nature which it is well for us to feel, and, recognising how strangely similar in

the inmost essence of its life, one great nation is to another. The conventional idea of the Chinaman which prevails in England is that he is altogether a whimsical kind of being, not partaking of the ordinary qualities of human nature, full of absurdities, paradoxes, and endless topsy-turvyisms of thought and action. It is commonly supposed that he does almost everything in the opposite way to ourselves, with the implicit assumption that ours is the right way, and that he is a very funny fellow for doing things otherwise. In this is a double error, as it not only removes the Celestial from the category of rational beings and from the light of reality, but also places him in an entirely false light of spurious romance of our own invention. Those of us who have been long resident in Cathay, on the contrary, soon learn to strip off this meretricious guise of romance and to see the Chinaman in a most prosy, most commonplace, and most uninteresting light altogether. But we are too apt to give him credit for being interested in little else than "cash" and "chow-chow"; in spite of ourselves we cannot conceive him in an ideal aspect or credit him with any delicacy of feeling or fineness of taste.

Yet these people also are richly endowed with that mysterious creative power of imagination which gives to genius its light and to love its glory. Across their hearts also have swept the rush of enthusiasm for brave deeds and the sweetness of kind thoughts, trembling tenderness, discursive fancy, soft breathings of pity, and the rain of tears.

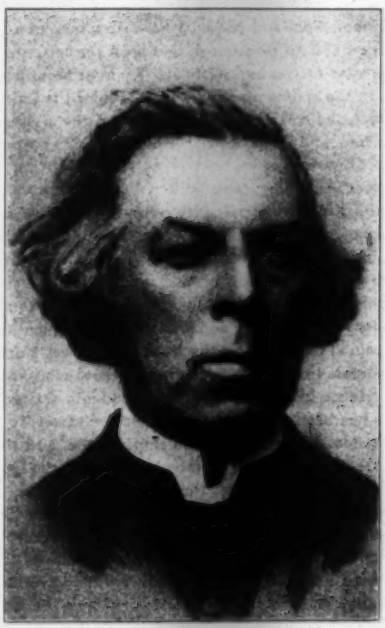
It has lifted them, as it has lifted us, above the dust, has made them fellow-heritors of the gifts of time, and taught them to build out of the rude and sordid conditions of their actual life an ideal world, wide and spacious, and filled with forms of nobleness and beauty.

MISCELLANEOUS.

JOHN CAIRD.

(1820–1898.)

Dr. John Caird, whose portrait we give in connexion with the present note, occupied the distinguished position of Principal of the University of Glasgow,



JOHN CAIRD.

Scotland, from 1873, till his lamented death in July, 1898. With the exception of Gladstone and Carlyle, he was in many ways the most remarkable Scotsman of the last generation. At all events it may be said that he, along with his eminent brother,

Edward Caird, now Master of Balliol College, Oxford, and for twenty-seven years Professor of Philosophy in the University of Glasgow, accomplished more than any two men elsewhere in Europe to alter the entire intellectual outlook of a nation.

John Caird was born at Greenock, on the Clyde, in 1820. In 1845, after a distinguished academic career, he graduated from the University of Glasgow, and entered the ministry of the Church of Scotland as a moderate Calvinist. Between 1845 and 1857 he gained the reputation, which he never lost, of being the most eloquent preacher in Britain. Those who know say that no one could stand comparison with him, and that only Schenkel of Heidelberg served to remind one of him. He thus gained enormous influence with masses of men; and his opportunity to use this continuously came when he was removed to Glasgow, in 1857. But, ere this took place, a change had come over his opinions. He had been deeply affected by German thought, especially by Hegel and Vatke. When he was appointed to the professorship of Theology at Glasgow, in 1862, he had both occasion and time to continue his researches, with the result that he became to his countrymen the great spokesman of a modified Hegelianism. For years he was regarded with veneration, especially by the younger generation, as the leader of liberal theology. In this capacity he wielded unbounded sway, so much so that, thanks to him and his brother, the philosopher, Scotland passed from Calvinism to a fervent and broad-minded spiritual religion. As Edinburgh had been the headquarters of philosophical influence in the later forties and early fifties, under Hamilton, and as Aberdeen had held the palm, in the sixties, under Bain, so, under the Cairds, Glasgow gained her old renown, which she had enjoyed at the end of the eighteenth century under Adam Smith and Reid and Hutcheson. During his incumbency of the Gifford Lectureship, Caird drew enormous audiences, far exceeding those gathered by other incumbents, not excepting Max Müller. His position in these prelections might be best described by saying that they represented Hegelianism of the Centre.

But Caird, with all his popular gifts, was a shy and retiring man; he was also a slow writer, and neither his public appearances, nor his three books and half-dozen printed addresses, account for his influence. It took source in the man's character. He seemed to be altogether unconscious of his wonderful endowment; pretension, thoughtless partizanship, and kindred qualities, had no place in his character. His power gained tenfold intensity from transparent sincerity, from his gentleness, and his readiness to be of service even to those who seemed to occupy unimportant places. Hence his death, though it suddenly arrived when he was full of years and honor, has been regarded as a national disaster by the Scotch. They possess no liberal standard-bearer to fill the empty place, and they have no orator who can be compared with him for a moment. From the Queen on the throne to the humblest workingman who takes thought concerning life, a thrill of grief has run over the northern land. As, when Burns died, Scotsmen the world over cried, "Who will be our poet now?" so when Caird passed, they wistfully inquired, "Who will be our preacher now?" They had to wait long for Scott; they will have to linger at least as long, ere they produce a man to follow John Caird, the Glasgow Chrysostomus.

R. M. WENLEY.

PROFESSOR GASTON BONET-MAURY.

The custom which has sprung up during the last few years in our American universities of inviting distinguished French scholars to lecture before the students,

seems, fortunately, to be taking still deeper and more solid root. After M. Ferdinand Brunetière and M. René Doumic, you have just recently had with you a professor not less able in his particular field, M. Gaston Bonet-Maury, who fills the chair of church history in the Protestant Theological Seminary of the Paris University. This learned and broad-minded clergyman has spent the summer in the United States lecturing at Chicago University, Chautauqua and elsewhere.

At first blush it strikes one as a little odd that a Protestant divine should have sprung from the Bonet-Maury family. The father was a Catholic and a soldier, who fought under Napoleon I., and died during the reign of Louis XVIII., having attained to the grade of general and being at the head of the famous Paris Polytech-

GASTON BONET MAURY.

nic School. He was born at Castres, one of the historic centres of *Languedocian* Protestantism, but it was the fact that his wife was a Lutheran and the consequent agreement that the children should be Protestant, that turned the young Gaston towards the Reformed Church. Perhaps it was this union of the two faiths under the same roof and the concessions and toleration which necessarily followed, that produced in the son a broad theologian, for M. Gaston Bonet-Maury is, to use the French ecclesiastical term, an anti-confessionalist or liberal, who accepts the doctrines of the early Unitarians of the James Martineau persuasion, as he once remarked to me.

It is not surprising, therefore, that M. Bonet-Maury's chief work, *Des Origines du Christianisme Unitaire chez les Anglais*, should be a glorification of

Unitarianism. "It is the Unitarians," he says, "who, by their name and principles, can prevent the imminent divorce between science and religion, between reason and faith." Though but a small portion of this scholarly book is devoted to the Unitarian movement in the United States, the names of Channing and Parker frequently appear on its pages. In one place we read: "When one notices the enthusiasm with which the centennial anniversary of the birth of W. E. Channing was celebrated and the success obtained by the translation of his works among our French Protestants and even in the remotest Catholic circles, this doctrine cannot be treated with the disdain affected by certain Calvinistic and Lutheran theologians."

In this same volume occurs this passage: "In our century, it is two American thinkers, Channing and Parker, who have given the greatest *éclat* to the Unitarian Christianity of the Anglo-Saxons. Channing, by the admirable simplicity of his heart, and by an intelligent sympathy for hard labor; Theodore Parker by his noble demand of liberty for the slave and by the uprightness of his character, gave to Socinian Unitarianism what it lacked in the way of heartiness and knowledge of the soul. It may be said that in Channing, Unitarian Christianity attained to the apogee of its development and manifested all the power of its social and emancipative forces. Channing's Christianity appears to us a synthesis of revelation and reason placed within the reach of all men."

The liberal-mindedness of M. Bonet-Maury is revealed in his own words in the closing passage of his introduction to his translation of Döllinger's letters and declarations concerning the decrees of the Vatican,[1] where he gives this passage from the author: "Whosoever believes in Christ, loves his country and the Christians of all sects and must hope to see founded, in a not-distant future, a church, which, being the legitimate heir of the ancient church of the earlier centuries, will offer sufficient room and will be attractive enough for our separated brothers; a church which will know how to reconcile liberty with order, discipline with morality, and unity of faith with science and free examination," and follows it with these comments: "Is not this aim worthy of obtaining the co-operation of all enlightened believers? Is not there the ideal future revealed by the founder himself of Christianity? Fiat unum ovile et unus pastor!" And elsewhere M. Bonet-Maury quotes with approval this "wise motto" of Augustine: "In certis unitas, in dubiis libertas, in omnibus caritas."

But the breadth of M. Bonet-Maury's religious views comes out best perhaps in his strong admiration for the Chicago Parliament of Religions and in his labors to bring about a somewhat similar gathering at Paris during the International Exhibition of 1900. He went to the United States in 1893—"this voyage across the ocean dreamed of for twenty-five years and which has left on my mind ineffaceable recollections"—as a delegate from the liberal branch of French Protestantism to the Unitarian conference held at Chicago in that year; but when he learned that this gathering was only a part of the Parliament of Religions, "this grandiose conception . . . . . this assembly unique of its kind," he was carried away by "this strange congress" and forthwith began to send letters and articles about it to the *Journal des Débats* and other French periodicals, which excited so much curiosity that when he got home he was invited on all sides to lecture and write about it. "So during nearly a year the greater part of my leisure time was taken up with making it known and in propagating its spirit of peace and union." Finally, M.

[1] The French title of this work is: *Doellinger,—Lettres et Déclarations au Sujet des Décrets du Vatican.*" Paris: Armand Colin.

Bonet-Maury was invited by a leading publisher, Hachette, to prepare a book on the subject. Hence the origin of *Le Congrès des Religions*, perhaps the best of the works devoted to the Chicago Parliament of Religions.

Another characteristic of M. Bonet-Maury's mental make-up calls for a few words. I refer to his remarkable—especially for a Frenchman—linguistic accomplishments. He has a good acquaintance with at least ten different languages, three dead and seven living. This faculty for the tongues is inherited. His father and mother both knew two modern ones, while his uncle, M. Alfred Maury, who died in 1892 professor at the Collège of France, was conversant with some thirty or more. It was this distinguished polyglot who instilled into his young nephew a taste for linguistics. Of course, therefore, M. Bonet-Maury knows English, which he reads with perfect ease, writes with considerable correctness, and speaks with much fluency and but slight accent. His American lectures will be delivered in our tongue, except the final one in each course, which will be given in French in order that the audience may get a more exact idea of the lecturer at his best. M. Bonet-Maury's wide knowledge of modern languages is also brought out in his essay on Bürger—"G. A. Bürger et les Origenes Anglaises de la Ballade Littéraire en Allemogne"—where he does not hesitate to handle familiarly several tongues and dialects.

M. Bonet-Maury is a quiet speaker. What he says is given in almost a conversational tone, with an occasional reference to the manuscript which lies on the desk before him. There is no attempt at eloquence. Now and then a bit of gentle humor brightens the clearly stated facts and solid arguments His gestures are few and simple. All this is quite in keeping with his cosy little lecture-room in the neat seminary back of the Paris observatory. I fear he may not appear to the best advantage in the large lecture halls of Chicago and Chautauqua, reading his typewritten essays. But you will readily perceive that he speaks with authority, and will, I feel sure, overlook defects of manner and accent in listening to the learning and liberal thoughts which he will utter.

The series of Chicago lectures opens with an introductory one on religious liberty and the obstacles which lie in the way of its realisation. Then follows a lecture on John Huss, "martyr to religious liberty, inheritor of the thought of John Wycliffe, and the precursor of Luther;" a third on the revocation of the edict of Nantes and the repressive measures in France since 1698, "when Protestantism was put beyond the pale of the law, anybody found at a religious gathering sent to the galleys and every preacher condemned to death, Claude Bronsson being the first martyr"; another devoted to Peter Kheltchitsky, "the continuator of the Hussite reformation and the founder of the Church of the United Brethren of Bohemia and Moravia"; a fifth to the insurrection of the Camisards in Languedoc; another to John Alasco, the Polish baron and canon, converted to Protestantism by Zwingli and Melanchthon, "the greatest of the Polish reformers"; another to "the restorers in France of the reformed religion,—Antoine Court and Paul Rabant"; the eighth lecture to John Komensky (Comenius), "the last of the Moravian bishops, and the precursor of modern pedagogy and of the idea of a court of international arbitration"; the ninth to "the edict of 1787, promulgated by Louis XVI., which restored to the Protestants of France their civil rights and the tolerance of their religion, due to the efforts of Turgot, Malesherbes and General Lafayette, whose American friends had interested him in the lot of the French Huguenots"; the tenth to Rousseau, "whose Social Contract and letter to Archbishop Beaumont established the principles of the independence of Church and State and

of tolerance which finally prevailed at the end of the French Revolution"; and the eleventh to one of M. Bonet-Maury's heroes, Leo Tolstoi, "the Jean Jacques Rousseau of Russia, on whose shoulders has been laid the mantle of Kheltchitsky and Comenius, who is striving to reform the moral and religious state of his country by education, and who is defending at the peril of his own safety the cause of the religious dissenters of Russia persecuted by the orthodox clergy and the Holy Synod"

The final lecture at Chicago is peculiarly timely, as it has to do with the absurd but dangerous anti-Semitic movement now so active in France. M. Bonet-Maury finds its cause to be "the jealousies of Catholics, rivals of the clever Jew merchants and bankers," and declares it to be "in disaccord with the French spirit and incompatible with the Evangel." It is scarcely necessary for me to add that M. Bonet-Maury is one of those "intellectuals" who warmly support M. Zola in the effort to clear up the obscure Dreyfus affair, so that his treatment of this complex subject will be in sympathy with the feeling which prevails in America concerning it.

The five Chautauqua lectures are made up of the more popular and lighter elements of the Chicago course. The series begins with an account of Claude Bronsson, "the martyred lawyer-preacher, who, after the revocation of the Edict of Nantes, was executed in 1698 at Montpellier." This is followed by a similar study of Laporte-Roland, "the prophet-general, hero of the Camissard insurrection, who expired on the rack August 16, 1704." A third lecture is given up to Count Zinzendorf, "restorer of the Moravian sect"; a fourth to Antoine Court, restorer of the reformed church of France," and the final lecture is also on Tolstoi, who is this time described as "the reformer of Russian society and defender of the persecuted Russian Protestants," for, it should be remembered, at this very moment there exists in the Czar's realms suffering for conscience sake as deep and bitter as that which followed the revocation of the Edict of Nantes. The facts on this point which M. Bonet-Maury has been laying before his hearers have, I feel sure, aroused a spirit of astonishment and indignation surpassed only by pity for the victims.

THEODORE STANTON.

PARIS.

RECENT FRENCH PHILOSOPHICAL WORKS.

A distinguishing feature of the philosophical thought of the last few decades has been its intimate relations with exact science; and the solidest and most enduring contributions which have been made to recent metaphysics have dealt with the critical foundations of positive research. Of the large number of thoughtful publications which have issued from the French press in the last half year on this subject, we shall mention first two essays by Dr. G. Milhaud, of the University of Montpellier, which bear the titles: (1) *An Essay on the Conditions and Limits of Logical Certitude;*[1] and (2) *On the Nature of Rational Knowledge.*[2] The first of the volumes mentioned is in its second edition, and aims to show that the principle of logical contradiction in no wise justifies affirmations extending beyond

[1] *Essai sur les conditions et les limites de la certitude logique.* By G. Milhaud. Paris: Félix Alcan, 108 Boulevard Saint-Germain. 1898. Pp. 203. Price, 2 francs.

[2] *Le Rationnel: Études complémentaires à l'essai sur la certitude logique.* By Milhaud. Paris: Félix Alcan. 1898. Pp. 176. Price, 2 francs.

the particular facts directly observed, and that it is an illusion to imagine it can effect the definitive solution of problems that lie without the realm of experience. His method rests on distinguishing fundamentally *what is given in reality* from *what has been constructed in thought;* in other words, on the distinction of *facts* from *constructs*. In establishing his thesis, he appeals to examples in mathematics, the study of which he has made a specialty, discussing such subjects as number, algebraical magnitude, limits, energy, determinism, and free will, the Non-Euclidean geometry, and the mathematical antinomies of Kant. The second volume is in the nature of supplementary studies to the first, and discusses virtually the same topics. The two essays will be found pleasant and instructive reading, and give constant evidence of the author's wide knowledge of the history of science. To him, the development of science is not one of spontaneous, direct and conscious creation, but involves certain elements of contingency and indetermination.

* * *

The *Problem of the Classification of the Sciences* has always been one that has appealed strongly to the French mind, and numerous solutions of this fundamental question of descriptive philosophy have been attempted in recent years. The history of the problem began with Aristotle and found its most distinguished promoters in Bacon, D'Alembert, Ampère, and Comte. The idea of Ampère was that of a classification similar to the systems of natural history, in which the various divisions of science were made to correspond to the species of zoölogy and botany. Comte, as is well known, enunciated the idea of a hierarchical scale of the sciences—an idea which may be traced back to Descartes. The classification of Comte has been widely studied and widely adopted, but new research has in a measure antiquated the details of the system, and it is for this reason that Prof. Edmond Goblot,[1] of the University of Toulouse, has set himself the task of rectifying, extending, and generally improving, on the lines of new ideas, the system of his great countryman. But M. Goblot's work is entirely independent in character; it has been his object to define, so to speak, "the systematic position" of every science; to define the relations of each with one another. He conceives the sciences generally to be single in form; that the demonstrative method and the experimental method are not attributes of different kinds of science, but are distinctive of the different states of the progress of science generally. Science, in his conception, is not an artificial and factitious construction, not the product of the brain of a single philosopher, a masterpiece of art as it appears to the mind of Descartes; but science is a coherent unity, in spite of the differences of the laborers and architects who have constructed it. It is not the thought of one individual mind added to the thoughts of other individual minds, but it is the *truth* in the conceptions of one mind, joined to the truths in the conceptions of other minds; the personalities are effaced; their impersonal products are alone perpetuated. In such a work as the present, then, the task is merely that of observing and describing, and not of the construction of a rigid frame into which truth must be forced, even at the risk of mutilation; science is a living and growing organism, the progress of which has, for such a task as the present, simply to be observed and recorded.

It seems remarkable enough that M. Goblot originally approached the problem of the classification of the sciences from the point of view of political economy, and particularly of the so-called problem of "immaterial wealth." He was of the opinion that economical science had made scarcely any real progress, so far as matters

1 *Essai sur La Classification des Sciences.* By Edmond Goblot. Paris: Félix Alcan, 108 Boulevard Saint-Germain. Pp. 296. Price, 5 francs.

of principle were concerned, since the time of Adam Smith and of Say, and that the reason for its stagnancy had been the restricting of its research to the study of material wealth alone, and he was thus led to the observation of a striking analogy between certain economical laws and certain laws of logic; even logic itself appeared to him as a branch of sociology; but since sociology itself was a nascent science, he here reached the heart of his task, and was brought face to face with the problem of the definition and conception of science in its entirety, of science as a composite made up of integrant and coherent thoughts. One is struck with the many wise observations which occur in his book regarding various fundamental questions of philosophy, and with the naturalness and clearness of his views. He believes that philosophy is contained in its entirety in the facts and relations of the individual sciences, in so far as it is rational, that is, comprehensible; but, in thus proclaiming the absorption of philosophy in science, M. Goblot expressly disclaims any intention of mutilating philosophy or of repudiating metaphysics proper, which still has its distinct and legitimate sphere. The crucial problems of metaphysics, so called in former times, are for him improperly formulated problems only, which when carefully analysed are discovered to be meaningless. When split up into their constituent elements they fall at once under the jurisdiction of some special science. The general ideas of Plato, the theory of "definition" of Aristotle, from having been questions of metaphysics, have been converted into questions of psychology and logic; there is no Unknowable, there are no "things in themselves," there are no insoluble problems; such problems are merely nonsensical and meaningless; they ask for knowledge which is not knowledge; it is not the answer, but the interrogation, that is at fault.

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Readers of *The Open Court* will remember the biographical sketch which appeared in the August number, of Count Chambrun, the founder of the Social Museum in Paris, and a social philanthropist of educational rather than eleemosynary tendencies. Count Chambrun, in 1894, founded a free course of lectures on the history of socialism which were to be delivered under the auspices of the *Faculté des Lettres* of Paris. The present incumbent of the chair founded by Count Chambrun, M. Alfred Espinas, professor in the University of Bordeaux, has just published a book on the *Social Philosophy of the Eighteenth Century and the Revolution*,[1] which embodies the principal lectures of this course. The author has sought to determine the periods and circumstances in which socialism was promulgated in Europe, and to describe the crises of which it was either the symptom or the cause. He first gives us an introductory chapter which contrasts ideal ethics and politics with the ethics and politics which are the expression of the actual local and historical conditions in which states and societies have risen. He finds that there have been five great critical periods in which socialism has been proclaimed as a doctrine, viz., during the decline of the Greek states, during the decline of the Roman Empire (Christianity), during the Renaissance in England and Germany, during the Eighteenth Century in France and the Revolution that closed that century, and during the Revolution of 1848. Where others have seen in the Revolution an intellectualist movement created by an intellectualist philosophy, M. Espinas has been led to the opinion that the philosophy of equality which prevailed in this century involved a collectivist theory of the part which the state plays in the ques-

1 *La Philosophie Sociale du XVIII. Siècle et La Révolution*. By Alfred Espinas. Paris. 1898. Félix Alcan. Pp. 412. Price, 7 francs.

tion of property, and he has pointed out the consequences which that theory bore from Mirabeau to Robespierre and Babeuf; these consequences he has traced in detail, laying special emphasis upon the philosophy of Babeuf with all the practical corollaries which that philosophy involved. Much of the research of M. Espinas with regard to this last point has been based upon unpublished documents.

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We have to note also a work of importance in the *History of Philosophy*.[1] It is written by M. Emile Boutroux, a professor of philosophy in the University of Paris, and recently elected a member of the Academy of Sciences. M. Boutroux's conception of the history of philosophy is that of an independent consideration of the doctrines of the philosophers in and for themselves. He conceives all their doctrines as independent organisms, as living thoughts which it is the duty of the historian to resuscitate and rehabilitate in the glowing form which they took in the minds of their originators, and not to study as a total development or as a psychological evolution. It has been in this sense that he has devoted considerable study, which he has here recorded, to the systems of Socrates, Aristotle, Jacob Boehme, Descartes, Kant, and to the relations between the Scottish and the French philosophy,—studies all of which are signalised by a thorough grasp of their subjects.

* * *

Persons desiring healthful and invigorating exercise in metaphysics may read the work of M. Cyrille Blondeau[2] on *The Absolute and the Law of Its Formation*,—a production distinguished by literary merit and great philosophical erudition, but slightly diffuse. The aim of its author has been to rise above the Relative and the Conditioned, and to seek that higher "law," or phase, of existence in which man and nature are equally submerged. The opposition between sense and reason is the fundamental thesis from which he starts. The senses give relative results only; science must give the absolute. Things are only relations, but these things are relations within the infinite, within the absolute, and even science itself, which explains nature and yields knowledge of the reasons for facts, is part and parcel of the absolute from which all results are derived, and which is the goal of all rational study, dissipating the contradictions inherent in things from the point of view of relative science, and thus making everything converge toward metaphysics. Despite the metaphysical argumentation of the work, it proceeds in the main from the principles of modern mechanical and physical science, and of modern physiology and psychology, thus proceeding to ontology. The absolute or the universe itself is the infinity of space and of time in which all things are entangled; and the order of nature is merely the relation of things which in turn are relations of things, and so on to infinity. Everything is thus enwebbed in the mesh of relations which constitute the universe, and absolute unity remains unimpaired.

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The most recent attempt at solving the ancient problem of the nature and origin of life has been made by M. Préaubert, professor in Angers, France, in a work entitled, *Life as a Mode of Motion*.[3] The phenomena of life are, according to M. Préaubert, distinctly enough defined and sufficiently well known at the present

[1] *Etudes D'Histoire de La Philosophie*. By Emile Boutroux. Paris. 1897. Félix Alcan. Pp. 443. Price, 7 francs.

[2] *L'Absolu et Sa Loi Constitutive*. By Cyrille Blondeau. Paris. 1897. Félix Alcan. Pp. 350. Price, 6 francs.

[3] *La Vie, Mode de Mouvement. Essai D'Une Théorie Physique des Phénomènes Vitaux*. By E. Préaubert. Paris: Félix Alcan. 1897. Pp. 310. Price, 5 francs.

time. We see them constantly associated with the phenomena of the inanimate world, and logically some bond must exist between them; there can be no reason whatever for establishing a barrier between them, or of prohibiting the explanation of any one by any other. The problem of life is involved in that of the organisation of nature in its entirety: it is but a particular case of universal cosmogony.

M. Préaubert is a physicist, and as the Pythagoreans explained the world by the properties of numbers, as Aristoxenes, the musician, explained the universe by the nature of harmony, and as certain modern nosologists have conceived the soul to be a composite of smells,—so M. Préaubert, being an expounder and champion of the modern theory of mechanical ether, explains life as a mode of motion of the fundamental *physical* world substance. Biology with him is a question of mechanics and not one of chemistry. Life is a distinct and independent member of that great orchestra of forces which hymns the universe to its destiny. Its substratum is the ether of which it is a mode of motion, just as electricity and magnetism, heat and light, are. The vital movement is prior to the protoplasmic molecule. The albuminoid bodies are no more life than iron is magnetism; they are simply substances fitted for being the vehicle of life.

The work bristles with analogies from technical physics which in themselves have nothing more than a metaphorical value, and do not constitute a real acquisition. Nevertheless, the work contains ingenious comparisons of this sort, the most notable of which is the assimilating of life to "globular lightning" which exhibits a form of electrical stability of a really astonishing character. T. J. McC.

OCTOBER MONIST.

There are two noteworthy articles in the October *Monist* relating to the philosophy of mathematics and to the question of a universal scientific language. The first is *On the Foundations of Geometry*, and is by Prof. H. Poincaré, the most eminent mathematician of France; the second is *On Pasigraphy*, by Prof. Ernst Schroeder, of Karlsruhe, the leading European authority on the Algebra of Logic.

In the same number Dr. P. Topinard closes his series on *Science and Faith* with an article on *The Social Problem*. The readers of *The Monist* have been following Dr. Topinard's History of the Development of Man in Society for two years or more, and will be glad to learn the results to which his exhaustive inquiries have led him. The editor, Dr. Paul Carus, contributes an article on *God*. (Single numbers, 50 cents. Annually, $2.00. Chicago: The Open Court Publishing Company.)

A MINISTERS' UNION OF ALL DENOMINATIONS.

This is an organisation which has been in existence for about four years. It meets semi-annually at the town hall in Ayer, Mass.—a spring and a fall meeting. There are rarely less than thirty ministers, of six or seven different denominations, Congregationalists, Unitarians, Baptists, Methodists, and Episcopalians predominating. It is an all-day convention, all dining together in a frugal repast, but making up in good-fellowship what it lacks in richness and variety of diet. Lately the afternoon session has been opened to the public, and questions of general interest pertaining to social, parish, and town life, reform, and good citizenship have been discussed by experts, and the meetings are closed by the joint recitation of the Lord's Prayer. No special efforts are made to interest non-members to join the

body or to attend the sessions. The presidents have been Baptist, Unitarian, and Methodist. Preceding the present incumbent (the Rev. Dr. Whittaker, Methodist), it was a Unitarian, the Rev. A. J. Rich, who presided for two one-half years. It is meant that the different denominations shall be alternately represented in the chairmanship, although the purpose is to drop the sect name and spirit as much as possible, and to strive for unity, brotherly love, truth, and helpfulness to each other in all ways which touch the common life and well-being of the members and their work and success as Christian preachers and pastors. Addressses have been given by Catholic priests, Jewish rabbis, and specialists on the vital questions of the day. Such men as Dean Hodges, Dr. Dickinson, of the Institutional Church (Berkeley), Boston; Rabbi Fleischer, of Boston, and Dr. Whittaker, have read papers. Dr. Hale has also spoken at the meetings. The Union owes its existence to the Rev. W. J. Batt, chaplain of the Concord (Mass.) Reformatory, formerly an Orthodox Congregational minister of a large and sympathetic spirit. The broadening influence of this organisation is seen and felt in all the circle of the non-ecclesiastical conference, devoted to religious unity; and, since its fellowship includes Jews as well as Christians, Catholics as well as Protestants, Free Religionists, and Pagans, if they choose to come, special emphasis is not given to any phase of religious belief or profession. It is quite sufficient to deal with questions of human interest and of practical well-being. A similar organisation called "The Souhegan Ministers' Union" was started in Milford, N. H., eight years ago, including ministers of all denominations in a circle of six or seven towns around. It met at first every two weeks, then every month. For about a year the meetings have been suspended, partly because of the removal of pastors, and partly because some brethren, fearing the result of such free mingling of orthodox and heretic, have withdrawn. An attempt will be made soon to resume the meetings, which for six years proved to be very interesting and profitable. In three or four Boston suburban towns similar unions have been started.—*The Outlook*, Sept. 10, 1898.

SPIRITUAL CATHOLICISM.

To the Editor of the Open Court:

A writer who assumes to instruct should be exact. In a very interesting and instructive article on "Chinese Fiction," by Mr. George T. Candlin, in the current number of *The Open Court*, appears this statement: "In Roman Catholicism this tendency has reached exaggerated expression in the worship of the Virgin."

The word worship is sometimes poetically employed in the sense of, to honor respect and love, as in the case of the lover who "worships" his loved one. In this sense no exception might be taken to the sentence quoted. But I think it is evident the writer uses the word to express the homage which the finite being pays to the Infinite—in this case misdirected to a finite being.

If this be true, then, it is a careless use of the term which is not in keeping with an article painstaking in its preparation and instructive. Catholic doctrine is an open book, and its erroneous presentation is inexcusable and worse, because it wilfully or carelessly compromises the judgment and belief of millions of people—no small fault surely. If one desires to be just to his neighbor it is worth while to know what his neighbor professes and believes before ascribing particular opinions and beliefs to him.

"We reverence tradition
And heed inspired men's
Prophetic intuition,
But seek higher evidence.
There is but one foundation,
But one sure ground, forsooth:
It is the revelation
Of science and 'the' truth."

Most men believe as a historical fact that Mary was the mother of Christ. Catholic doctrine teaches that Christ is the son of God the Father, coequal with Him in all things, and that there is but one God.

As the mother of God, Catholics accord all the honor to Mary it is possible to give a creature, but they worship or offer divine homage to God alone.

EL PASO, TEXAS. FRANCIS W. GALLAGHER.

We regret that *The New World* descends to the publication of slander. E. Washburn Hopkins, in a book review of *Buddhism and Its Christian Critics*, speaks of "the notorious Dharmapâla, a Singhalese, who some time ago made himself somewhat ridiculous in India, and has more recently been in America, followed in his journey hither by warnings in the Anglo-Indian press to the effect that he is an impostor."

Dharmapâla is a pure-hearted man of deep and serious conviction, who has gained the good-will and friendship of many Americans not only among those who sympathise with his religious views but also among others, and most so among orthodox Christians. The following brief statement will explain the facts to which Professor Hopkins refers: Dharmapâla discovered that the Buddhists had some rights to the use of the Buddha Gaya temple in India, now under the control of a Hindu Mahant, although subject to the supervision of the Government. When Dharmapâla placed a Buddha statue in the Buddha Gaya temple, he was interfered with by a mob of natives who upon the whole are very hostile toward Buddhism. In a law suit which ensued and which was finally decided in favor of Dharmapâla, the local papers took the part of the Mahant and of the mob, and many bitter words were published against Dharmapâla which have no other foundation than the animosity of partisans. It is difficult to understand how a professor of Yale University can unblushingly make of himself a channel of slander and how a magazine like *The New World* can publish it.

We might say a few words in reply to the comments which Professor Hopkins makes on Dr. Carus's book, *Buddhism and Its Christian Critics*, but believe that the venomous spitefulness of his review is a sufficient refutation and self-condemnation.

The Welby prize of fifty pounds offered for the best essay on "The Causes of the Present Obscurity and Confusion in Psychological and Philosophical Terminology, and the Directions in which We May Hope for Efficient Practical Remedy," has been awarded to Dr. Ferdinand Toennies, of Hamburg, Germany. A translation of the successful essay will appear in *Mind* shortly. Although the name of the donor of the prize has not been revealed, it is pretty well understood in philosophical circles that it is the Honorable Lady Welby, of Denton Manor, Grantham, England, whose interest in terminology has taken not only the form of monetary encouragement but also that of independent contributions to the subject.

We are indebted for the four fine portraits of Pascal which adorn the present number of *The Open Court*, to the kindness of Principal David Eugene Smith, of Brockport, N. Y., who has placed his rich collection at our disposal. The originals from which these portraits were reproduced are very rare in this country.